3Com ®

New Installation for NETBuilder II® Software

Software version 10.1

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3COM CORPORATION LIMITED WARRANTY

ABOUT THIS GUIDE

Introduction

This guide describes how to get started with your new NETBuilder II® bridge/router. It describes how to install NETBuilder software and perform the initial system boot. It also explains how to access and use the command-line interface to establish basic settings.

If you are upgrading software from an earlier version, refer to *Upgrading NETBuilder Family Software*.

If the information in the release notes shipped with your product differs from the information in this guide, follow the release notes.

Before you use the information in this guide, you must first install the bridge/router according to your hardware installation guide.

Additional Information When you have completed the procedures in this guide, you will find valuable information in *Using NETBuilder Family Software*, which will help you configure your software for bridging, routing, and wide area protocols, according to the particular needs of your network. For a comprehensive description of NETBuilder software commands, refer to *Reference for NETBuilder Family Software*.

Audience Description This guide is intended for network administrators who:

- Have experience in planning, maintaining, and troubleshooting local or wide area networks.
- Are familiar with network protocols, bridging and routing, and network management.
- Will be responsible for configuring and operating NETBuilder II bridge/routers.

How to Use This Guide

The chapters in this guide include the following information to help you install and configure NETBuilder software:

- **Chapter 1** describes NETBuilder II systems that can use software version 10.1. It also provides start-up checklists for systems with either a Dual Processor Engine (DPE) module or a Communications Engine Card (CEC) 20 module.
- **Chapter 2** describes how to install software and boot a NETBuilder II system with a DPE module.
- **Chapter 3** describes how to change the primary boot source on a NETBuilder II system with a DPE module.
- **Chapter 4** describes how to install software and boot a NETBuilder II system with a CEC 20 module. Several software installation options are described.
- **Chapter 5** describes how to change the primary boot source on a NETBuilder II system with a CEC 20 module.
- **Chapter 6** describes how to log on to the system, obtain Network Manager privileges, set passwords, time, date, and system administrator information, assign Internet addresses, set NETBuilder security, and verify system operation.

■ **Appendix A** describes how to boot a NETBuilder II system with a CEC 20 from the network using TFTP and **Appendix B** has instructions on how to obtain technical support.

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1   Notice Icons

Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of personal safety, system damage, or loss of data
	Warning	Risk of severe personal injury

Table 2   Text Conventions

Convention	Description
Syntax	Evaluate the syntax provided and supply the appropriate values. Placeholders for values you must supply appear in angle brackets. Example: Enable RIPIP using: SETDefault !<port> -RIPIP CONTrol = Listen In this example, you must supply a port number for <port>.
Commands	Enter the command exactly as shown in text and press the Return or Enter key. Example: To remove the IP address, enter: **SETDefault !0 -IP NETaddr = 0.0.0.0** *This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only the uppercase letters and the appropriate value. Commands are not case-sensitive.*
Screen displays	This typeface represents information as it appears on the screen.
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
[Key] names	Key names appear in text in one of two ways: ■ Referred to by their labels, such as "the Return key" or "the Escape key" ■ Written with brackets, such as [Return] or [Esc]. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press [Ctrl]+[Alt]+[Del].
Menu commands and *buttons*	Menu commands or button names appear in italics. Example: From the *Help* menu, select *Contents*.
Words in *italicized* type	Italics emphasize a point or denote new terms at the place where they are defined in the text.
Words in **bold-face** type	Bold text denotes key features.

1
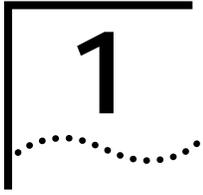
OVERVIEW

This chapter is an overview of how to get started with your new NETBuilder II system. This chapter provides you with two checklists: one describes the basic steps for starting a NETBuilder II system with a Dual Processor Engine (DPE) module and the other describes the basic steps for starting a NETBuilder II system with a Communication Engine Card (CEC) 20 module.

NETBuilder II Systems

The NETBuilder II system consists of a 4-Slot, 8-Slot, or 8-Slot Extended chassis, the main processor module (either a DPE or CEC 20), and NETBuilder II software.

Your new bridge/router is either an EZBuilt preassembled NETBuilder II system or a NETBuilder II system that you have assembled from components.

EZBuilt Preassembled NETBuilder II System

If you have an EZBuilt NETBuilder II system, it was preassembled before delivery. This guide assumes that you have followed the instructions in the hardware installation guide to:

- Set up the system.
- Attach the network and power cables.
- Install a local terminal, PC (with a terminal emulation application), or modem to the console port of the main processor module.

Component System

If you have a NETBuilder II system that you have assembled yourself from components, this guide assumes that you have followed the instructions in each hardware installation manual to:

- Install the system components.
- Attach the network and power cables.
- Install a local terminal, PC (with a terminal emulation application), or modem to the console port of the main processor module.

NETBuilder II Chassis with a DPE Module

The DPE module has two built-in flash memory drives. The upper drive is drive A, and the lower drive is drive B. The DPE module does not support a floppy disk drive or the flash drives used with the CEC 20 module.

NETBuilder II Chassis with a CEC 20 Module

The CEC 20 module has an internal flash memory drive. The flash memory drive is designated as drive A.

Software	The NETBuilder software is available from 3Com on a preinstalled 20 MB flash memory card or on CD-ROM. 3Com recommends that you buy the preinstalled flash memory card.
	Refer to the *NETBuilder II Software Release Notes* for information about the different software packages that are available for your NETBuilder II system. The procedures in this guide apply to all software packages.

Installation Checklists   This section contains a checklist for installing software and booting a NETBuilder II with a DPE module and a checklist for installing software and booting a NETBuilder II with a CEC 20 module.

When using the checklists, refer to the chapters that apply to your system:

- **Chapter 2** and **Chapter 3** apply only to NETBuilder II systems that have a DPE module.

- **Chapter 4** and **Chapter 5** apply only to NETBuilder II systems that have a CEC 20 module.

- **Chapter 6** applies to all NETBuilder II systems.

NETBuilder II Systems with a DPE Module   Use the following checklist to install software, boot, and configure basic settings on a NETBuilder II system with a DPE module.

Install System Software and Boot — Refer to Chapter 2.

❏ Install software from a flash memory card.

Change the Primary Boot Source — Refer to Chapter 3

❏ Change the primary boot source default as needed.

Configure Basic Settings — Refer to Chapter 6.

❏ Log on to the system.
❏ Familiarize yourself with the command-line or menu-driven user interface (UI), storing configuration parameter values, and getting help.
❏ Obtain Network Manager privilege level.
❏ Change the Network Manager password.
❏ Adjust the time and date if necessary. Time and date are preset and may need to be adjusted for your time zone.
❏ Set system administrator information:
    ❏ System name and location
    ❏ System contact name and phone number
❏ Assign IP addresses/subnet masks to individual ports or one address to the system.
❏ Set up the bridge/router for SNMP.
❏ Set up NETBuilder II system security.
❏ Use the Quick Installation Utility for further configuration.

Configure Specific Services for Your Network — Refer to *Using NETBuilder Family Software* and *Reference for NETBuilder Family Software*.

NETBuilder II Systems with a CEC 20 Module

Use the following checklist to install system software, boot the system, and configure basic settings on a NETBuilder II system that has a CEC 20 module.

Install System Software and Boot — Refer to Chapter 4

❑ Select an installation option and proceed to appropriate installation section:
  ❑ Install software from flash memory card and boot the system.
    or
  ❑ Install software from CD-ROM on UNIX or PC-based network management station and boot the system.

Change the Primary Boot Source — Refer to Chapter 5

❑ Change the primary boot source default as needed.

Configure Basic Settings — Refer to Chapter 6

❑ Log on to the system.
❑ Familiarize yourself with the command-line or menu-driven user interface (UI), storing configuration parameter values, and getting help.
❑ Obtain Network Manager privilege level.
❑ Change the Network Manager password.
❑ Adjust the time and date if necessary. Time and date are preset and may need to be adjusted for your time zone.
❑ Set system administrator information:
  ❑ System name
  ❑ System location
  ❑ System contact name and phone number
❑ Assign IP addresses/subnet masks to individual ports or one address to the system.
❑ Set up the bridge/router for SNMP.
❑ Set up NETBuilder security.
❑ Use the Quick Installation Utility for further configuration.

Configure Specific Services for Your Network — Refer to *Using NETBuilder Family Software* and *Reference for NETBuilder Family Software*.

2

INSTALLING SOFTWARE AND BOOTING A DPE NETBUILDER II SYSTEM

This chapter contains the following procedures:

- Installing and booting NETBuilder software
- Making a backup copy of the software flash memory card

Installing Software and Performing Initial Boot

NETBuilder software can be installed in the following ways:

- From a flash memory card with preinstalled software. 3Com recommends this method.

  EZBuilt NETBuilder II systems have a factory-installed software flash memory card. To boot your EZBuilt system, refer to "Booting an EZBuilt NETBuilder II System."

  For component NETBuilder II systems to boot from a flash memory card, they mus have a flash memory drive installed. For installation instructions, refer to the *NETBuilder II Flash Memory Drive Installation Guide*. After you have installed a flash memory drive, refer to "Booting a Component NETBuilder II System" on page 2-2 for instructions on booting your system.

- From CD-ROM on a UNIX-based or PC-based network management station using TFTP

Booting from the Flash Memory Card

To start the NETBuilder II system from a flash memory card with preinstalled software, follow the procedures in this section.

Prerequisites

Before you boot your new NETBuilder II system, you need to complete all setup and installation instructions in the hardware guide provided with the system and system components. You also need to connect a console to your system.

Booting an EZBuilt NETBuilder II System

The EZBuilt NETBuilder II system comes with a factory-installed flash memory card that contain the NETBuilder software. To boot an EZBuilt NETBuilder II system, follow these steps:

1 Turn on the EZBuilt NETBuilder system.

The NETBuilder II system boots from the default boot source a:/primary/boot.29K (the flash memory drive).

2 When the boot operation is complete, press the Return key on the console.

The NETBuilder console prompt should appear on the screen.

If the console is not operating properly (if you see incorrect characters, or no characters), refer to the setup instructions in the hardware installation guide.

You are ready to establish basic settings on your system. Refer to Chapter 6 for more information.

Booting a Component NETBuilder II System

To boot a component NETBuilder II system, follow these steps:

1 Insert a flash memory card with preinstalled software in drive A on the DPE module.

2 Turn on the NETBuilder II bridge/router.

The NETBuilder II system boots from the default boot source a:/primary/boot.29K (the flash memory drive).

3 When the boot operation is complete, press the Return key on the console.

The NETBuilder console prompt should appear on the screen.

If the console is not operating properly (if you see incorrect characters, or no characters), refer to the setup instructions in the hardware installation guide.

You are ready to establish basic settings on your system. Refer to Chapter 6 for more information.

If you want to change the primary boot source from the default or adjust system configuration parameters, refer to Chapter 5 and the description in the SysconF appendix in *Reference for NETBuilder Family Software*.

Making a Backup of the Flash Memory Card

As part of the installation procedure, 3Com recommends that you create a backup of your NETBuilder software on a blank flash memory card. Refer to the software release notes for a list of flash memory cards that can be used with the DPE module.

Prerequisites

Before you begin this procedure, complete the following tasks:

- Boot your NETBuilder II system with software on a flash memory card inserted into drive A of the DPE module.

Insert NETBuilder software flash memory card into drive A

NETBuilder II 4-Slot chassis
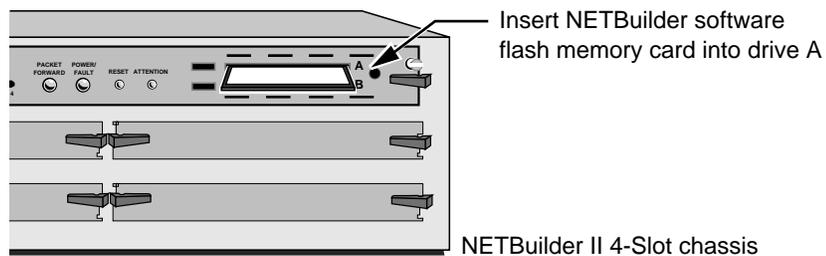
- Log on to the system as root.

Procedure

To make a backup copy of the NETBuilder software flash memory card, follow these steps:

1 Insert a supported blank flash memory card into drive B of the DPE module. Refer to the software release notes for a list of flash memory cards that can be used with the DPE module.

Original flash memory card in drive A

Insert blank flash memory card in drive B
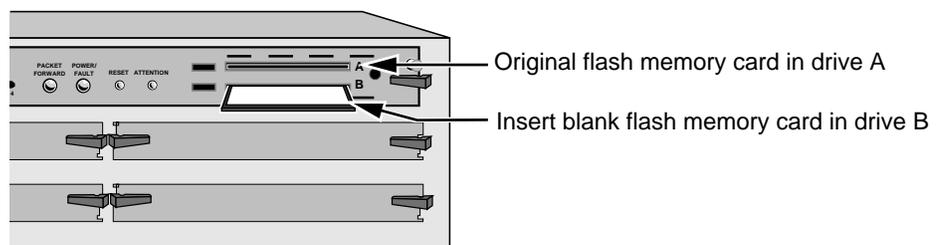
2 Format the blank flash memory card in drive B by entering:

FORMAT b:

Type Y for yes when the formatting confirmation message is displayed.

3 Create a directory on the formatted flash memory card by entering:

MakeDir b:primary

4 Copy the software from the NETBuilder software flash memory card in drive A to the formatted flash memory card in drive B by entering:

COpy a:/primary/* b:/primary/
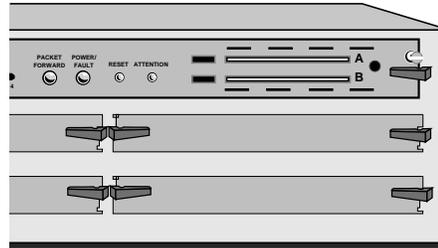
Copy contents of drive A to the directory you created on drive B

5 After you have copied the software, replace the original NETBuilder software flash memory card in drive A with the backup copy from drive B.
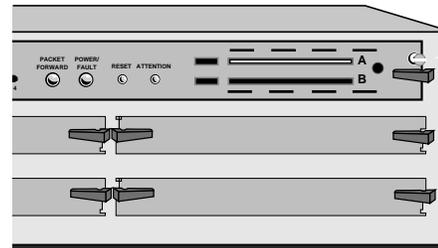
Replace original card in drive A with new copy from drive B. Keep the original card as a backup.

Keep the original NETBuilder software flash memory card in a safe place and protect it from accidental damage. The original is your backup in the rare event that the NETBuilder software or the backup flash memory card becomes corrupted. Refer to ″Using the Backup Flash Card″ on page 2-3 for instructions on installing the backup flash memory card.

6 The NETBuilder software boot files for a DPE module are factory shipped with a:/primary/boot.29k as the default primary boot source. If you have installed the NETBuilder software on drive A, and you want to keep the same boot file as the boot source, use the Reboot command to reboot your NETBuilder II bridge/router by entering:

ReBoot

7 If you want to configure your primary boot source to a drive and file other than the default, refer to Chapter 3 for instructions on configuring the boot source for the NETBuilder II bridge/router.

Using the Backup Flash Card

If the NETBuilder software has been corrupted and you need to reboot, use your original NETBuilder II software flash memory card to reset your system by following these steps:

1 Remove the corrupted flash memory card from the DPE module.

2 Insert the original NETBuilder software flash memory card into drive A on the DPE module.

3 Reboot the NETBuilder II bridge/router by pressing the two outer buttons on the LCD control panel.

The system boots from the NETBuilder II software flash memory card in drive A.

4 Make a copy of the flash memory card in drive A by following the steps in the previous procedure.

You will need to either obtain an additional flash memory card or reformat the corrupted flash memory card. If you choose to reformat a corrupted flash memory card, inspect the card to make sure that it is not damaged. Always keep the original NETBuilder II software flash memory card in a safe place and protect it from accidental damage.

3

CHANGING THE BOOT SOURCE ON A DPE NETBUILDER II SYSTEM

This chapter describes how to change the primary boot source on a NETBuilder II bridge/router with a DPE module.

The NETBuilder software boot files for a DPE module are factory shipped with a:/101/boot.29k as the default primary boot source. If you have installed the NETBuilder software flash memory card into drive A, and you want to keep the default boot source, skip this chapter and refer to Chapter 6.

If you want to adjust system configuration settings, refer to the SysconF appendix in *Reference for NETBuilder Family Software* for instructions on how to make the changes.

Using the Boot Command

The Boot Monitor utility Boot (BT) command allows you to reboot or to override the default boot path. The BT command is useful if the boot path has a typing error or if you have a malfunctioning drive. If you enter a new boot path, the Primary Boot Source parameter is updated to reflect the new path.

To reboot the NETBuilder II bridge/router using the Boot Monitor utility Boot command, follow these steps:

1 Reset the system in one of two ways. Either press the two outer buttons on the LCD control panel on the front of the NETBuilder chassis, or press the reset button on the DPE module.

LCD control panel buttons on front panel
of a NETBuilder II bridge/router

DPE module

Push both reset buttons simultaneously
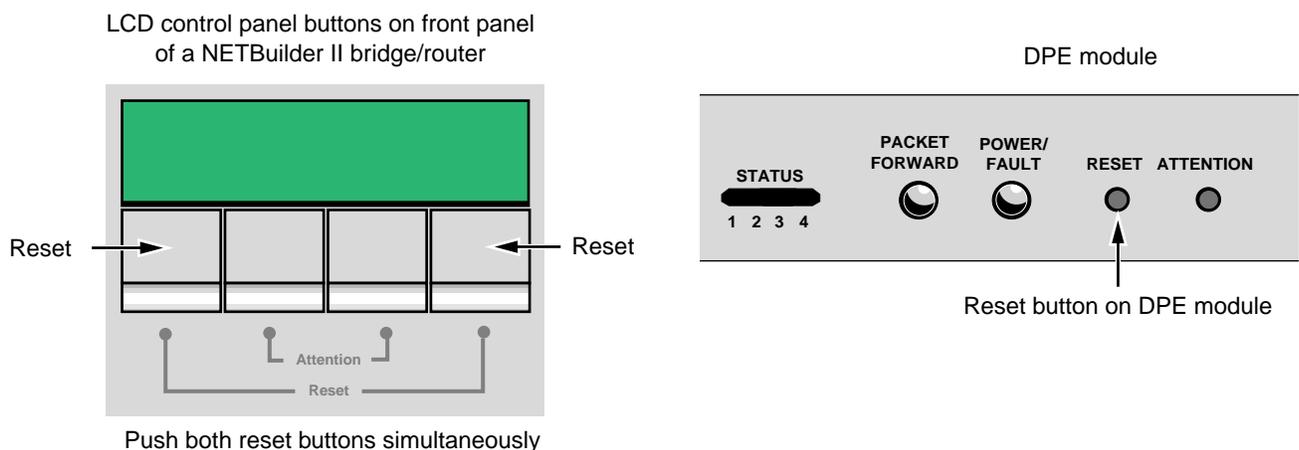
The console displays the following startup message:

```
Do you want to enter the boot monitor? (y/n)
```

Entering Y within five seconds enters the boot monitor. If you enter N or enter nothing, the NETBuilder II system begins booting the software.

For more information about the Boot Monitor utility, refer to the Firmware appendix in *Reference for NETBuilder Family Software*.

2 To enter the Boot Monitor utility, enter:

Y

3 Enter a boot path using:

BT <drive>: /<path>/<filename>

If you do not enter the <drive> value, drive A is used. To boot from drive A, enter:

BT a:/primary/boot29.k

The system attempts to boot from the specified image file. If an error occurs, a message is sent to the console and you are returned to the boot monitor.

For more information about the Boot Monitor utility refer to the Boot Monitor appendix in *Reference for NETBuilder Family Software*.

Configuring the Primary Boot Source

Drive A is the default primary boot source. This procedure establishes drive B as the primary boot source.

Prerequisites

Before beginning this procedure, complete the following tasks:

- Install the system software and boot the NETBuilder II system according to the instructions in Chapter 2.

- Attach a terminal, a PC with a terminal emulation program, or a modem for using a remote PC to the console port on the DPE module and make sure that this terminal is operating properly. If your terminal is not operating properly, refer to the hardware installation guide for setup instructions.

Procedure

To change the primary boot source to a drive or file other than the default or the current drive setting, follow these steps:

1 Press the Return key.

The following prompt is displayed on your console:

NetLogin:

2 Log on as root by entering:

root

3 Press the Return key.

Pressing the Return key when prompted for the password enters a null string, which is the default local password.

The bridge/router system prompt is displayed:

NETBuilder #

You are now ready to enter software commands.

4 At the NETBuilder prompt, enter:

SysconF 2

The Primary Boot Source menu is displayed:

```
Primary Boot Source:
1. Boot Filename:              a:/primary/boot.29k
2. Config File Source         a:/primary
3. IP Addresses               Client:none Subnet Mask:none
4. FTP Login Parameters
Enter parameter number or press Q to quit:
```

5 Enter 1 to select a boot filename.

Information similar to the following is displayed:

```
Current Boot Filename: a:/101/boot.29k
Enter Boot Filename (CR = no change):
```

6 Enter a new boot filename (such as b:/101/boot.29k) and press the Return key.

The configuration files must reside on the same drive as the boot source. If the drive you specify is different from the configuration boot source drive, you are prompted to change the configuration file source to the same drive.

If the boot drive you specify conflicts with the one set in the Dump Destination parameter, you are prompted for a different drive.

7 Enter q to quit the menu.

The System Configuration menu showing the new entries is displayed:

```
System Configuration
1. Serial Ports                 Console:  9600
2. Primary Boot Source          b:/101/boot.29k, b:/
3. Secondary Boot Source        b:/boot.29k, b:/
4. Test Boot Source             a:/boot.29k, a:/:
5. Boot Sources                 Primary and Secondary
6. Dump Destination             Partial dump only
7. Recovery Procedure
8. MP Boot Source
9. Boot Statistics              Booted:  1 Exceptions:  0
Enter parameter number or press Q to quit:
```

8 Enter q to quit the configuration program.

9 At the prompt, enter:

ReBoot

The NETBuilder II bridge/router reboots using the newly established drive B as the primary boot source.

For drive B to function as the boot source, a flash memory card with software version 10.1 must be installed in drive B.

4

INSTALLING SOFTWARE AND BOOTING A CEC 20 NETBUILDER II SYSTEM

This chapter contains the following procedures:

- Installing and booting NETBuilder software
- Making a backup copy of the software flash memory card

Installing Software and Performing Initial Boot

NETBuilder software can be installed in the following ways:

- From a flash memory card with preinstalled software. 3Com recommends this method.

  EZBuilt NETBuilder II systems have a factory-installed software flash memory card. To boot your EZBuilt system, refer to "Booting an EZBuilt NETBuilder II System."

  For component NETBuilder II systems to boot from a flash memory card, they mus have a flash memory drive installed. For installation instructions, refer to the *NETBuilder II Flash Memory Drive Installation Guide.* After you have installed a flash memory drive, refer to "Booting a Component NETBuilder II System" on page 4-2 for instructions on booting your system.

- From CD-ROM on a UNIX-based or PC-based network management station using TFTP

Booting from the Flash Memory Card

To start your NETBuilder II system from a flash memory card with preinstalled software, follow the procedures in this section.

Prerequisites

Before you boot your new NETBuilder II system, you need to complete all setup and installation instructions in the hardware guide provided with the system and system components. You also need to connect a console to your system.

Booting an EZBuilt NETBuilder II System

The EZBuilt NETBuilder II system comes with a factory-installed flash memory card that contains the NETBuilder software. To boot an EZBuilt NETBuilder II system, follow these steps:

1 Turn on the EZBuilt NETBuilder system.

The NETBuilder II system boots from the default boot source a:/101/boot.29K (the flash memory drive).

2 When the boot operation is complete, press the Return key on the console.

The NETBuilder console prompt should appear on the screen.

If the console is not operating properly (if you see incorrect characters, or no characters), refer to the setup instructions in the hardware installation guide.

You are ready to establish basic settings on your system. Refer to Chapter 6 for more information.

Booting a Component NETBuilder II System

To boot a component NETBuilder II system, follow these steps:

1 Install a flash memory drive in your NETBuilder II system. For instructions, refer to the *NETBuilder II Flash Memory Drive Installation Guide*.

2 Install a flash memory card with preinstalled software in the flash memory drive.

> *To install the flash memory card, turn off the bridge/router, disconnect the cables, and remove the cover. Insert the flash memory card into the flash memory drive. Reinstall the cover and reconnect the power cord and other cables.*

3 Turn on the NETBuilder II bridge/router.

The NETBuilder II system boots from the default boot source a:/101/boot.29K (the flash memory drive).

4 When the boot operation is complete, press the Return key on the console.

The NETBuilder console prompt should appear on the screen.

If the console is not operating properly (if you see incorrect characters, or no characters), refer to the setup instructions in the hardware installation guide.

You are ready to establish basic settings on your system. Refer to Chapter 6 for more information.

If you want to change the primary boot source from the default or adjust system configuration parameters, refer to Chapter 5 and the description in the SysconF appendix in *Reference for NETBuilder Family Software*.

Installing Software from a Network Management Station

This section describes how to install the NETBuilder II bridge/router software from CD-ROM on a UNIX-based or PC-based network management station with a CD-ROM drive.

> *The procedures in this section apply to the NETBuilder II component system only.*

This section contains the following procedures:

- Installing software on the UNIX-based network management station
- Installing sofware on the PC-based network management station
- Booting a NETBuilder II image over the network
- Setting up IP routing on the NETBuilder II bridge/router
- Copying image files to the local NETBuilder II bridge/router flash drive for local booting and rebooting

Setting Up the UNIX-based Network Management Station

This procedure provides instructions for setting up the UNIX-based network management station (see Figure 4-1).

Prerequisites

To install the NETBuilder bridge/router software image from a CD-ROM, the CD-ROM drive must reside either locally on the network management station or on another system on the network.

Before installing the software from CD-ROM, make sure that:

- Your network management station is running Solaris 2.4 or 2.5x, SunOS 4.1.4, HP-UX 9.0.5, 10.10 or 10.20, or IBM AIX 3.2.5, 4.1.4 or 4.2. To verify the operating system environment, enter:

  uname -a

  The version message refers to Solaris 2.5x as SunOS 5.5.

- You know the root password.

- The network management station has sufficient disk space for the amount of software you are installing. Minimal disk storage requirements are dependent on the number of NETBuilder systems being installed. Allocate 40 MB for the NETBuilder Upgrade Management Utilities and software image, 4 MB for each NETBuilder II system.

- The NETBuilder Upgrade Management Utilities released with this software package have been installed on the network management station. Refer to *Upgrading NETBuilder Family Software* for more information.

- Install a blank flash memory card in the NETBuilder II bridge/router. For installation instructions, refer to the *NETBuilder II Flash Memory Drive Installation Guide.*

For a list of flash memory cards that can be used with the CEC 20 module, refer to the software release notes.

At the network management station:

a) Insert NETBuilder II software CD-ROM into CD-ROM drive on NMS

b) Copy the NETBuilder II software to TFTP boot directory on NMS

c) Select TFTP file in the NMS as primary boot source

At the console:

d) Set up IP routing

e) Transfer software to NETBuilder II with TFTP
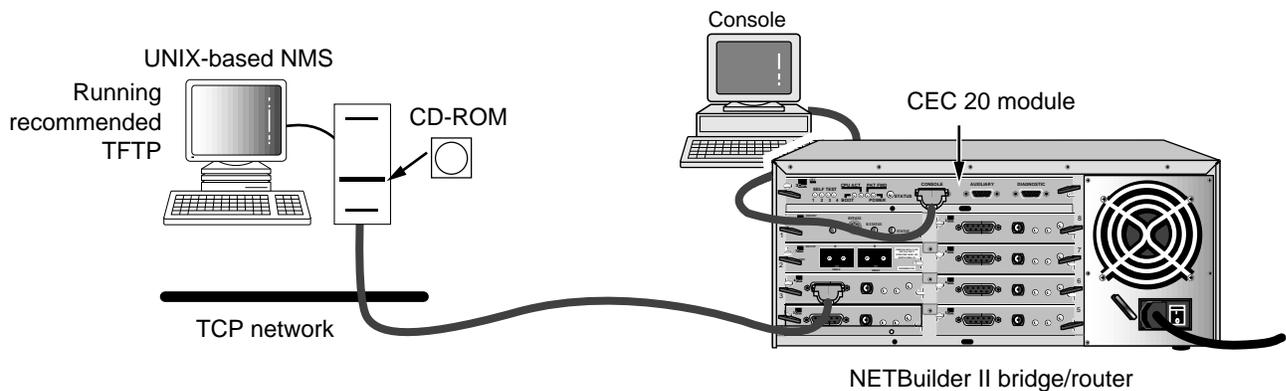
Figure 4-1   Installing NETBuilder II Software from CD-ROM on a UNIX NMS

Procedure

To install the NETBuilder software on the UNIX network management station, follow these steps:

1 Format the blank flash memory card in drive A by entering:

FORMAT A:

Type Y for yes when the formatting confirmation message is displayed.

2 Make sure the TFTP server on the network management station is running and has been correctly configured by confirming that the TFTP or inetd daemons are running.

To see if these daemons are running, enter:

ps ax |more

The resulting display shows every active process on the system.

3 Mount the software CD-ROM on the network management station.

For mount instructions for your specific UNIX operating system, refer to *Upgrading NETBuilder Family Software*.

4 Set environmental variables with the location of NETBuilder Upgrade Management Utilities.

These variables depend on the UNIX shell that is installed at your site.

- If you are using a C-shell (csh), enter:

  source /usr/3Com/common/data/.login-bcm

- If you are using a Bourne (sh) or Korn (ksh) shell, enter:

  . /usr/3Com/common/data/.profile-bcm

5 Ensure that you are using the version of the NETBuilder Upgrade Management Utilities that shipped with your software.

To check the version you have installed, enter:

bcmdiagnose -h

The version of the installed utilities is displayed in the following message:

bcmdiagnose version 10.1. Copyright 3Com Corporation 1997

If the version of the utilities you installed differs from the version shipped with your software package, you must first install the utilities shipped with your software package.

i *In the next step, the bcminstall utility extracts the files from the CD-ROM and installs them on the network management station hard disk in the /tftpboot/image/<platform>/ SW|FW/<version> /<pkg> directory. For example, the software may be installed in the /tftpboot/image/NBII/SW/101/FF directory. If the disk has insufficient space, you can link /tftpboot to another disk.*

6 If necessary, mount the CD-ROM drive on your UNIX system. Refer to your system documentation for instructions.

7 Using the NETBuilder Upgrade Management Utilities, install the NETBuilder bridge/router software from the CD-ROM by entering:

bcminstall

i *The optional path parameter can also be used to install the software on a network management station with two or more drives connected, as well as to install from a remote CD-ROM drive. You must explicitly specify the second CD-ROM drive.*

To install a NETBuilder package from a second CD-ROM drive on a Solaris machine, enter:

bcminstall -cdrom /cdrom/cdrom1/image

After the installation is complete, the screen shows an inventory of all NETBuilder packages installed, including previous versions you have installed. You are now ready to go to "Booting a NETBuilder II Image over the Network" on page 4-6.

Setting Up the PC-based Network Management Station

This section describes how to install NETBuilder II software from a CD-ROM on a PC network management station (see Figure 4-2).

Prerequisites

Before you install software and boot your new NETBuilder II system, you need to complete the procedures that apply to your system in the hardware installation guide. These procedures include installing components, setting up the system, attaching network and power cables, and attaching a terminal, PC (with a terminal emulation application), or modem to the console port on the DPE module.

Determine which TFTP server product you will use for the installation. You can successfully use the following products to install software from a PC-based network management station:

- A PC network management station with TFTP server capability
- Transcend Enterprise Manager for Windows 5.0 or later
- NETManage Chameleon version 4.0 or later
- FTP Software PC/TCP tools
- Distinct Corporation TCP/IP tools
- Novell LAN WorkPlace 5.0 or later

At the network management station:

a Insert CD-ROM with NETBuilder II software into NMS drive

At the console:

d Set up IP routing

b Copy the NETBuilder II software to TFTP boot directory on NMS

e With TFTP, transfer software to NETBuilder II

c Select TFTP file in the NMS as primary boot source

Console

PC NMS

Running recommended TFTP

CD-ROM

CEC 20 module

TCP network

NETBuilder II bridge/router
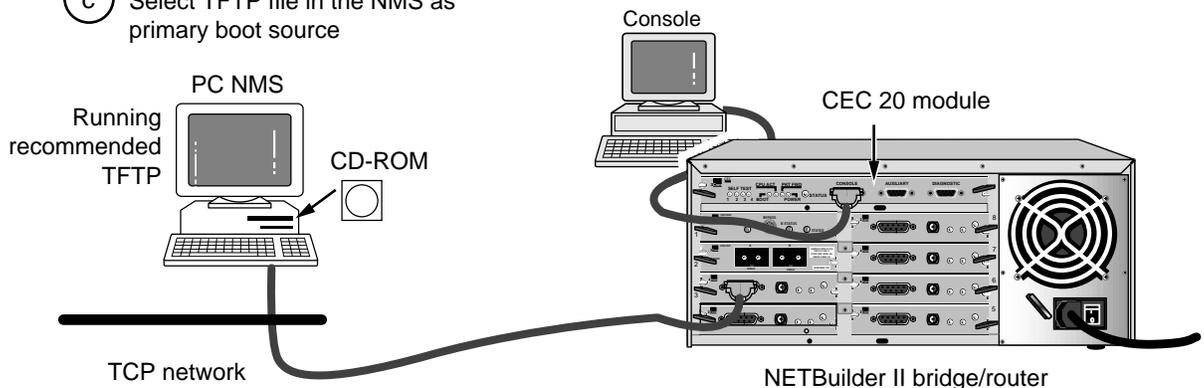
Figure 4-2   Installing NETBuilder II Software from CD-ROM on a PC NMS

Procedure

To install the bridge/router software, follow these steps:

1 Insert the software CD-ROM into the PC CD-ROM drive.

2 Ensure that the TFTP server is active and that it references the root directory of the CD-ROM.

Refer to the TFTP server documentation for information regarding procedures that you need to use to adjust the server parameters.

You are now ready to boot the NETBuilder II image over the network.

Booting a NETBuilder II Image over the Network

This section describes how to boot the NETBuilder II image over the network, which can be done from either a UNIX-based or PC-based network management station.

> *Network booting is supported over Ethernet, token ring, FDDI (but not FDDILink), and HSS ports using PPP.*

Table 4-1 lists additional boot source parameter settings, such as those related to booting over a token ring port, an HSS port using PPP, or a multiport Ethernet module. You may need to adjust these parameters based on your particular configuration.

Table 4-1   TFTP Primary Boot Source Parameter

Parameter	Configuration
Boot Device: Network	Interface number.
	You are prompted with this field only if an Ethernet 2-Port or Ethernet 6-Port module resides in the slot. Make sure this parameter is set to the appropriate interface (A or B or A–F). The default is A.
MP Module Parameters	You need to configure this parameter only if the TFTP server is reachable through an HSS port running PPP or a token ring port.
	HSS port running PPP If the boot source reachable through an HSS port running PPP, you are prompted to configure the following fields: ■ HSS Baud Rate This setting must correspond to the serial line setting. ■ HSS Clock Source Set this parameter appropriately (the default setting is external). ■ HSS Connector Type Set this parameter to the connector that the server is reachable through (the default is V.35). ■ HSS Protocol Select PPP. ■ HSS WAN Password Leave this field empty.
	Token ring port If the boot source is reachable through a token ring port, you are prompted to configure the following fields: ■ Token Ring Speed This setting must correspond to the token ring line setting (the default is 4 Mbps). ■ Token Ring Baud Rate Make sure the setting of this field corresponds to that of the token ring line.
Boot Protocol	Make sure the Boot Protocol is set to TFTP.
	If you are configuring the bridge/router to use TFTP only, set the Address Discovery Protocol to Local Configured Addresses.
	If you are configuring the bridge/router to use TFTP and BOOTP, set the Address Discovery Protocol to BOOTP.
Boot Sources	Make sure the Boot Sources are set to Primary and Secondary.
MAC Address	Make sure this parameter is set to the CEC MAC address.
ARP Format	If the boot source is reachable through a token ring port, make sure that the setting of this parameter agrees with the Address Resolution Protocol (ARP) format used on the token ring network: noncanonical.

Procedure

To boot the NETBuilder II image over the network, follow these steps:

1 Turn on the NETBuilder II system or press the two outer buttons on the LCD panel on the front of the chassis to reset the system.

2 Enter Y when the system asks if you want to enter the monitor.

3 From the NETBuilder monitor prompt (>), enter:

SF

The System Configuration menu is displayed.

4 Ensure that the System Configuration entry number 3, Start-Up Action, is set to Try boot once.

If Start-Up Action is not set to Try boot once, follow these steps:

a From the System Configuration menu, enter 3.

The Start-Up Action menu is displayed.

b Enter 3 to select Try boot once and press the Return key.

The System Configuration menu showing the Start-Up Action as Try boot once is displayed.

TFTP is a UDP-based function. Frames may be lost in transit. If this occurs, and the Start-Up Action is not set to Try boot once, lost frames can cause the boot process to continuously retry without success. Set the Start-Up Action to Try boot once to avoid this situation.

5 From the System Configuration menu, enter 4 to select Primary Boot Source.

The Primary Boot Source menu is displayed.

6 Enter 1 to select the Boot Device option, and enter 2 to set the Boot Device to Network.

You are then prompted to set the slot number and boot filename.

7 Enter the slot number of the module that is used to reach the TFTP server.

If you have a 4-Slot chassis, your options are 1 through 4. If you have an 8-Slot chassis, your options are 1 through 8.

8 Enter the image filename by entering the directory path and the filename relative to the tftpboot directory where the CEC boot image resides.

For example:

/image/NBII/SW/101/FF/boot.29k

You do not need to specify the /tftpboot directory because the TFTP server assumes the /tftpboot directory by default.

9 Enter Q to return to the Primary Boot Source menu.

10 Enter 5 to select the Boot Protocol option, and set the Primary Boot Protocol to TFTP.

You are then prompted to set the TFTP Address Discovery Protocol.

11 Set the TFTP Address Discovery Protocol to Local Configured Addresses.

12 Enter Q to return to the Primary Boot Source menu.

13 Enter 6 to select IP Addresses, and enter the primary IP addresses assigned to the TFTP client, TFTP server, gateway, remote file server, and subnet mask.

14 Enter Q repeatedly to return to the System Configuration menu.

15 Ensure that Boot Sources is set to Primary and Secondary.

If Boot Sources is not set correctly, follow these steps:

a From the System Configuration menu, enter 7.

b From the Boot Sources menu, enter 2.

16 Exit the menu system by typing Q repeatedly.

17 To boot the software image from the network management station, enter:

`NB`

The bridge/router obtains its software image from the network management station and boots.

When the following message is displayed:

`System Initialized and Running`

the bridge/router has finished booting.

Copying the Software to a Flash Memory Card

To boot locally, the software image boot file must be copied to the flash memory card in drive A.

Configuring IP

Before you copy the software to the NETBuilder II bridge/router flash memory card, you must configure IP for the port that the NETBuilder II bridge/router can be accessed through.

This procedure assumes that you have just booted the NETBuilder bridge/router over the network.

To configure IP on the NETBuilder II bridge/router, follow these steps:

1 Press the Return key.

The following prompt is displayed on the console:

`NetLogin:`

2 Log on as root:

`root`

3 Press the Return key.

Pressing the Return key when prompted for the password enters a null string, which is the default local password.

The bridge/router system prompt is displayed:

`NETBuilder #`

You are now ready to begin using the software and entering software commands.

4 Set up an IP address and subnet mask using:

`SETDefault !<port> -IP NETaddr = <IP address> [<subnet mask>]`

For more information on IP configuration, refer to *Reference for NETBuilder Family Software.*

5 Enable IP routing by entering:

`SETDefault -IP CONTrol = RO`

6 Enter a routing protocol.

For example, enable RIP using:

```
SETDefault !<port> -RIPIP CONTrol = (Listen, Talk)
```

7 Confirm your configuration by verifying that the NETBuilder II bridge/router can reach the network management station using:

```
PING <IP address>
```

where <IP address> is the IP address of the network management station.

Copying Software to the NETBuilder II Using TFTP

To copy the software from the network management station to the NETBuilder II bridge/router using TFTP, follow these steps:

1 If you have not already done so, insert a blank flash memory card in drive A.

Refer to the software release notes for a list of flash memory cards that can be used with the CEC 20 module.

For instructions on installing the flash memory drive and inserting a flash memory card, refer to the *NETBuilder II Flash Memory Drive Installation Guide*.

2 Format the blank flash memory card by entering:

FORMAT a:

Type Y at the formatting confirmation message.

3 Create a destination directory on the flash memory card.

MakeDir a:/primary

4 Copy the NETBuilder II software images from the network management default directory (tftpboot) into the /primary directory on the flash memory card.

For example:

COpy 192.65.74.10:image/NBII/SW/primary/FF/boot.29k a:/primary/boot.29k

where 192.65.74.10 is the IP address of the network management station.

The software images to copy to the NETBuilder II bridge/router may include the following files:

- boot.29k – Image file that boots the CEC20 module
- ccsmacro – File that contains predefined user macros
- sys – File that is used during the upgrade process to determine the source and target software versions
- mp6e.29k – Image file that boots the multiprocessor Ethernet module
- mpatm.29k – Image file that boots the multiprocessor ATM module

To change your bridge/router primary boot source, refer to Chapter 5.

5

CHANGING THE BOOT SOURCE ON A CEC 20 SYSTEM

This chapter describes how to change the primary boot source on a NETBuilder II bridge/router with a CEC 20 module.

The NETBuilder software boot files for a CEC 20 module are factory shipped with a:/101/boot.29k as the default primary boot source. If you have installed the NETBuilder software flash memory card into drive A, and you want to keep the default boot source, skip this chapter and refer to Chapter 6.

If you want to adjust system configuration settings, refer to the SysconF appendix in *Reference for NETBuilder Family Software* for instreuctions on how to make the changes.

Configuring the Primary Boot Source

Drive A is the default primary boot source. This procedure establishes Network and slot 7 as the primary boot source.

Prerequisites

Before beginning this procedure, complete the following tasks:

- Install the system software and boot the NETBuilder II system according to the instructions in Chapter 4.

- Attach a terminal, a PC with a terminal emulation program, or a modem to the console port on the CEC 20 module and make sure that the terminal is operating properly. If your terminal is not operating properly, refer to the hardware installation guide for setup instructions..

Procedure

To change the primary boot source to a drive or file other than the default or the current drive setting, follow these steps:

1 Press the Return key.

The following prompt is displayed on your console:

```
NetLogin:
```

2 Log on as root by entering:

root

3 Press the Return key.

Pressing the Return key when prompted for the password enters a null string, which is the default local password.

The bridge/router system prompt is displayed:

```
NETBuilder #
```

You are now ready to enter software commands.

If the bridge/router is unable to boot, enter Y at the monitor prompt, as shown in this screen display.

```
3Com Corporation        NETBuilder II          power-on
FW/NBII-FW,2.6
CEC*: 8 Mbytes IMEM, 8 Mbytes DMEM, 4 Mbytes SMEM
Booting from drive A ...
File - BOOT.29K - not found
Do you want to enter the monitor?  (y/n) : y
3Com Corporation        NETBuilder II          Monitor
>
```

4 Access the System Configuration menu by typing SF at the NETBuilder command prompt or in the firmware monitor.

Information similar to the following is displayed:

```
System Configuration
1. Serial Ports              Console:  9600   Auxiliary:  9600
2. Self-Test                 Skip
3. Start-Up Action           Try boot once
4. Primary Boot Source       Drive A:
5. Secondary Boot Source     Local: Drive A:
6. Test Boot Source          Unknown boot source    Slot: 0
7. Boot Sources              Primary and Secondary
8. Dump Destination          Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics          Booted:  7        Exceptions:  3
Enter parameter number or press Q to quit:
```

5 Enter 3 to select Start-Up Action.

Information similar to the following is displayed:

```
Start-Up Action:            Try boot once
1. Enter monitor
2. Local
3. Try boot once
4. Try boot forever
Choose Start-Up Action  or press Q to quit (CR=Try boot once):
```

6 Enter 4 to select Try boot forever.

Information similar to the following is displayed:

```
Start-Up Action:             Try boot forever
1. Enter monitor
2. Local
3. Try boot once
4. Try boot forever
Choose Start-Up Action  or press Q to quit (CR=Try boot forever):
```

7 Press the Return key to confirm.

Information similar to the following is displayed:

```
Updating EEPROM. Please wait . . .

System Configuration
1. Serial Ports              Console:  9600   Auxiliary:   9600
2. Self-Test                 Skip
3. Start-Up Action           Try boot forever
4. Primary Boot Source       Drive A
5. Secondary Boot Source     Local: Drive A:
6. Test Boot Source          Unknown boot source    Slot: 0
7. Boot Sources              Primary and Secondary
```

```
8. Dump Destination            Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics            Booted: 7      Exceptions:  3
Enter parameter number or press Q to quit:
```

Enter 4 to select Primary Boot Source.

Information similar to the following is displayed:

```
Primary Boot Source:
1. Boot Device:                    Drive A:
2. Default file source             Local:
3. Maximum retries                 0
4. I/O Module Parameters Ethernet
5. Boot Protocol                   TFTP Local configured addresses
6. IP Addresses              client:none
                                    Subnet Mask:none
7. MAC Address System              08-00-02-05-1A-BE
8. ARP Format                      Canonical
9. FTP Login Parameters
Enter parameter number or press Q to quit:
```

8 Enter 1 to select Boot Device.

Information similar to the following is displayed:

```
Primary Boot Device:
Local: Drive A:
1. Local
2. Network

Choose Primary Boot Device or press Q to quit:
```

9 Enter 2 to select Network.

Information similar to the following is displayed:

```
Network Boot:
Choose a slot  :
```

10 Enter the slot number where the CEC 20 is installed.

For example, type 7 to specify slot 7.

Information similar to the following is displayed:

```
Boot Filename: boot.29k
Enter Boot Filename (CR=no change):
```

11 Select the NETBuilder bridge/router software version 10.1 as the default boot source file by entering:

/primary/boot.29k

Information similar to the following is displayed:

```
Primary Boot Device:
Network: Slot 7:  /primary/boot.29k

1. Local
2. Network

Choose Primary Boot Device or press Q to quit:
```

12 Enter Q to quit the menu.

Information similar to the following is displayed:

```
Primary Boot Source:

1. Boot Device            Network: Slot: 7 /primary/boot.29k
2. Default File Source    Boot Device:
3. Maximum Retries        0
4. I/O Module Parameters  Ethernet
5. Boot Protocol          TFTP Local configured addresses
6. IP Addresses         client:none
                             Subnet Mask:none
7. MAC Address System     08-00-02-05-1A-BE
8. ARP Format             Canonical
9. FTP Login parameters
Enter parameter number or press Q to quit:
```

13 Enter 2 to select Default File Source.

Information similar to the following is displayed:

```
Current Default File Source: Boot Device
1. Boot Device
2. Local
3. Network
Choose a Primary Default File Source or press Q to quit:
```

14 Enter 2 to select Local.

Information similar to the following is displayed:

```
Current Default Directory for Files:
Enter Default Directory for Files (CR=no change):
```

15 To select NETBuilder software version 10.1 enter:

/primary

Information similar to the following is displayed:

```
Current Default File Source: Local: /primary
1. Boot Device
2. Local
3. Network
Choose a Primary Default File Source or press Q to quit:
```

16 Enter Q to quit the menu.

Information similar to the following is displayed:

```
Primary Boot Source:

1. Boot Device            Network: Slot: 7 /primary/boot.2k
2. Default File Source    Local: /primary
3. Maximum Retries        0
4. I/O Module Parameters  not used
5. Boot Protocol          TFTP Local configured addresses
6. IP Addresses         client:none
                             Subnet Mask:none
7. MAC Address System     08-00-02-05-1A-BE
8. ARP Format             Canonical
9. FTP Login parameters
Enter parameter number or press Q to quit:
```

17 Enter Q to quit the menu.

Information similar to the following is displayed:

```
System Configuration
1. Serial Ports              Console:  9600   Auxiliary:  9600
2. Self-Test                 Skip
3. Start-Up Action           Try boot forever
4. Primary Boot Source       Network: Slot: 7 /primary/boot.29k
5. Secondary Boot Source     Local:        /primary
6. Test Boot Source          Unknown boot source    Slot: 0
7. Boot Sources              Primary
8. Dump Destination          Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics          Booted: 7 Exceptions: 3
Enter parameter number or press Q to quit:
```

18 Ensure that Boot Sources are set to Primary. If the Boot Sources are set correctly, proceed to step 22. If the Boot Sources are not set to Primary and Secondary, proceed to the next step.

19 Enter 7 to select Boot Sources.

Information similar to the following is displayed:

```
Boot Sources: Primary and Secondary
1. Primary
2. Primary and Secondary
3. Secondary
Choose Boot Sources or press Q to quit(CR=Primary and Secondary):
```

20 Enter 2 to select Primary and Secondary.

Information similar to the following is displayed:

```
Boot Sources: Primary and Secondary
1. Primary
2. Primary and Secondary
3. Secondary
Choose Boot Sources or press Q to quit (CR=Primary):
```

21 Press the Return key to confirm Primary.

Information similar to the following is displayed:

```
System Configuration
1. Serial Ports              Console:  9600   Auxiliary:  9600
2. Self-Test                 Skip
3. Start-Up Action           Try boot forever
4. Primary Boot Source       Network: Slot: 7  /primary/boot.29k
5. Secondary Boot Source     Local:        /primary
6. Test Boot Source          Unknown boot source    Slot: 0
7. Boot Sources              Primary and Secondary
8. Dump Destination          Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics          Booted:  9      Exceptions:  6
Enter parameter number or press Q to quit:
```

22 Enter Q to quit the firmware configuration program.

23 At the monitor prompt, enter bt to reboot the NETBuilder II bridge/router from firmware, or enter rb to reboot the bridge/router from software.

6

CONFIGURING BASIC SETTINGS

This chapter describes preliminary tasks for configuring basic bridge/router settings. Before you begin configuring ports and paths (described in Chapter 1 of *Using NETBuilder Family Software*), complete the following tasks:

- Log on to the system.
- Familiarize yourself with the user interface.
- Learn how to get help.
- Set up IP routing.
- Store configuration parameter values.
- Obtain Network Manager privileges.
- Change the Network Manager password.
- Set the time and date.
- Set system administrator information.
- Assign IP addresses and subnet masks to individual ports or one address for the bridge/router.
- Set up the Simple Network Management Protocol (SNMP).
- Set up NETBuilder security.

Logging on to the System

To log on to the bridge/router, follow these steps:

1 Turn the bridge/router on or press the two outer (reset) buttons on the LCD panel on the front of the chassis.

The bridge/router takes a few minutes to complete the initialization process. Startup messages appear on your console display.

When you see the following message:

```
System Initialized and Running
```

the bridge/router has finished booting.

2 Press the Return key.

The following prompt is displayed on your console:

```
NetLogin:
```

3 Log on as root:

root

4 Press the Return key.

Pressing the Return key when prompted for the password enters a null string, which is the default local password. Later in this chapter, you will be instructed on how to change the password.

The bridge/router system prompt is displayed:

```
NETBuilder #
```

You are now ready to begin entering software commands.

Learning About the User Interface

This section describes how to access the bridge/router user interface and provides an overview of the menu-driven and command-line interfaces.

This section also includes the following information:

- How to specify values, set members, or set addresses when using either the menu-driven or command-line interface
- How to use online help

Accessing the User Interface

To access the user interface or to modify the configuration of the NETBuilder bridge/router, use one of the following methods:

- Access the bridge/router commands locally through the console port.
- Establish a Telnet session with the bridge/router using security passwords.
- Use a device (for example, a workstation) on the same extended network or internetwork to access the bridge/router through the Telnet protocol. NETBuilder software also supports outgoing Telnet.

  The software supports TCP and UDP over Bigger Addresses (TUBA), which means you can Telnet to the bridge/router using an IP address or an OSI NSAP address from a PC or workstation. For more information about using Telnet on a workstation, refer to the manual that accompanies the workstation.

- View and configure a subset of bridge/router parameters from a remote host using SNMP. For information on preparing the bridge/router to run SNMP, refer to *Using NETBuilder Family Software*.

After accessing the user interface, you need to decide whether to use the menu-driven interface or the command-line interface.

Menu-Driven Versus Command-Line Interface

After accessing the bridge/router user interface, you can issue a command in one of two ways:

- Use the menu-driven interface if you are unsure of the command syntax.

  For more information about the MEnu command, refer to *Reference for NETBuilder Family Software*. For information on how to use the menu-driven interface, see the next section.

- Enter the command at the system prompt if you know the exact syntax.

  For information about the command line and rules for entering commands, refer to "Using the Command-Line Interface" on page 6-3.

  The syntax for each command and parameter is described in *Reference for NETBuilder Family Software.*

Using the Menu-Driven Interface

The MEnu command allows you to perform the following operations:

- List the services available on the bridge/router.
- Choose a service and see the list of parameters available for the service.
- List the parameters in the current service.

- Choose a parameter and see the commands used with it.
- Check the active and default values of a particular parameter.
- Display the syntax of a particular parameter.
- Enter the new value of a parameter.

To use the menu-driven interface, you must have Network Manager privilege. When using the menu-driven interface, you cannot access some parameters; for example, you cannot alter the number of lines on the screen, or change privilege level. Accessing the NETBuilder bridge/router through the REMote command requires the command-line interface.

To use the menu-driven interface, follow these steps:

1 Access the main menu by entering:

MEnu

The Main menu (Level 1) is displayed.

Depending on your software package, the number of services in your Main menu may vary.

2 Select the desired service.

For example, selecting 1 from the Main menu (Level 1) display generates a menu for the SYS Service.

3 Select the parameter you want to configure.

For example, if you select the NMPrompt parameter from the SYS Service menu (Level 2) menu, information for that parameter is displayed.

The first part of the screen displays the value of the parameter; the second part lists the commands you can choose. For information on help menus, refer to "Getting Help" on page 6-16. For complete rules for entering commands and using aliases and history substitution, refer to "Using Aliases" on page 6-8, "Command History Substitution" on page 6-8, and "Command-Line Parameter Attributes" on page 6-9.

4 To return to the previous menu level, press the Return key.

If you are at the Main menu (level 1) and press the Return key, you return to the command-line interface.

Using the Command-Line Interface
This section describes how to enter commands and provides detailed information about using the command-line interface.

To use the command-line interface, follow these steps:

1 Type the command name.

If the command does not include a service name, parameter, or values, skip to step 3. If the command requires more information or if you want to include optional arguments, continue to step 2a.

If you need help identifying the parts of a command, see Figure 6-1.

a If the command has additional options, such as a port or path number, include them after the command name.

Including a specific port or path number in the command focuses the command on that port or path. If the port or path number is not included, the command acts on all ports or paths.

For more information on ports and paths, refer to Chapter 1 in *Using NETBuilder Family Software*. For more information on commands, refer to Chapter 1 in *Reference for NETBuilder Family Software*.

b If the command includes a parameter, type the service name (if necessary), the parameter name, and values.

The service name focuses the action of the command on a particular bridge/router service.

In some cases, you may not need to enter the service name. For example, if a parameter is unique to a service, the service does not need to be specified. If two or more services have parameters of the same name, you must include the service name in the syntax. For more information, refer to "Entering Service Names in Command Lines" on page 6-7.

The value part of the command specifies how you want the parameter to be set. Values include numerics, strings, or addresses, depending on the parameter. For additional information, refer to "Syntax for Assigning Values" on page 6-10.

2 After entering the complete command, press the Return key.

The bridge/router software includes online help for commands, services, parameters, and syntax, described in "Getting Help" on page 6-10. The syntax that appears in online help is the full-form syntax; it contains full names and visual cues for entering commands. You can also enter commands using an abbreviated version of the syntax.

For information on full-form and abbreviated syntax, read the following sections and see Figure 6-1 and Figure 6-2. For additional information on short cuts for entering commands, refer to "Using Aliases" on page 6-8 and "Command History Substitution" on page 6-8.

Full-Form Syntax

To display the full-form syntax (provided by online help in NETBuilder software) type a question mark (?) or a question mark with other options, as described in "Getting Help" on page 6-16.

Figure 6-1 shows the parts and symbols that make up command syntax. For more information on symbols, refer to "Symbols" on page 6-5.
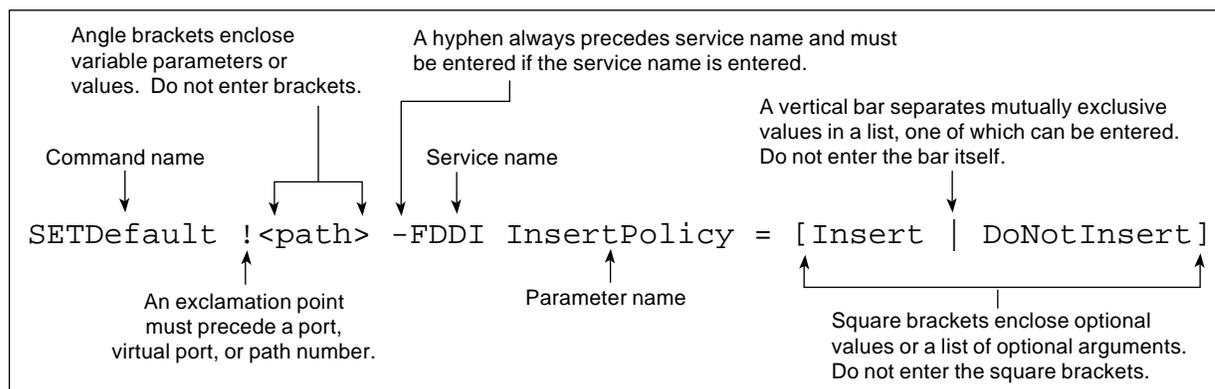
Figure 6-1 Full-Form Syntax

NETBuilder family bridge/router guides and online help use upper- and lowercase letters to distinguish the full form of commands and command syntax from the abbreviated form. You can enter a command in abbreviated form by typing only the uppercase portion. It does not matter whether you type the command in upper- or lowercase letters.

Abbreviated Syntax

Abbreviated syntax is the shortest unambiguous abbreviation of a command, parameter, or value that can be entered. You can enter the abbreviated form in lower- or uppercase letters at the NETBuilder prompt.

Figure 6-2 shows the abbreviated syntax that corresponds to the full-form syntax in Figure 6-1.

Figure 6-2   Abbreviated Syntax

Additional syntax examples are provided in "Full and Abbreviated Syntax Examples" on page 6-6.

Symbols

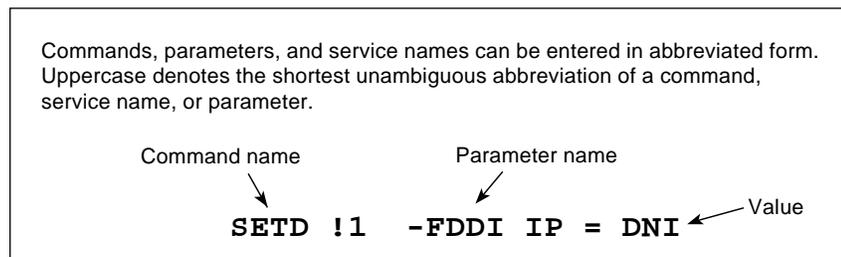You may see a variety of symbols shown as part of the command syntax. These symbols usually explain how to enter the command, and you do not type them as part of the command itself. The exceptions to this rule are parentheses, the hyphen, and the exclamation point, which you do type as part of the command. Table 6-1 summarizes command syntax symbols.

Table 6-1   Command Syntax Symbols

Symbol	Description
angle brackets < >	Enclose a variable or value. You must specify the variable or value; for example, in the syntax: `DELete –IP ADDRess <IP address>` you must supply an address for <IP address> when you enter the command. Do not type the angle brackets.
square brackets[ ]	Enclose an optional value or a list of optional arguments. One or more values or arguments can be specified. For example, in the syntax: `SET PRIvilege = [User	NetMgr]` you can specify either User or NetMgr when you enter the command. Do not type the square brackets.
parentheses ( )	Enclose a list of values that can be assigned to a single parameter. At least one of them must be selected. You must type the parentheses and separate the values with a comma if you are assigning more than one value. For example, in the syntax: `SET CurrentPorts = ALL	(<port>, <port>)` you can specify two port numbers by enclosing them in parentheses and separating them with a comma when you enter the command.

(continued)

Table 6-1   Command Syntax Symbols (continued)

Symbol	Description
vertical bar |	Separates mutually exclusive items in a list, one of which must be entered. For example, in the syntax: `SET ScreenLength = [None	<line>(6-100)]` you can specify either the word None or a number between 6 and 100 when you enter the command. Do not type the vertical bar.
ellipsis ...	Following a parameter name or value, indicates that one or more additional arguments may be specified on the same command line. For example, in the syntax: `ADD !<port> -IP SecAuthIn <authority> [<authority> ...] [ANY]` you can specify multiple authorities (GENSER, SIOP, SCI, NSA, DOE, NONE) when you enter the command. Do not type the ellipsis.
hyphen –	A letter preceded by a hyphen represents a command option. Also, when you enter a service name as part of the command, you must precede the service name with a hyphen. For example, in the command: **`SETDefault -BRidge CONTrol = Bridge`** You must include the hyphen with the service name BRidge when you enter the command.
braces { }	Enclose a list of values, one of which must be entered. For example, in the syntax: `SETDefault !<subaddr #> -Gateway SubAddrMap = {(<IPaddr> | <PSAPaddr>)	None}` you must enter either an IP address, PSAP address, or the word None when you enter the command. Do not type the braces.
exclamation point !	A number preceded by an exclamation point represents a port, virtual port, or path number. For example, in the syntax: `SHow [!<port>] -DECnet CONFiguration` the exclamation point must be included before the port number when you enter the command. The exclamation point is also used to refer to a profile number. Refer to the PROFile Service chapter in *Reference for NETBuilder Family Software*.

Full and Abbreviated Syntax Examples

The following examples show the full form first, followed by the abbreviated command syntax.

The full-form command syntax:

```
ADD !<port> -NRIP AdvToNeighbor <network>%<mac address> [...]
```

can be abbreviated to:

```
ADD !<port> -NRIP ATN <network>%<mac address> [...]
```

Replacing the variables in this abbreviated command syntax with values might specify, for example, that a neighbor on port 2, network number &10, with address %080002030ef2, receives RIP and SAP updates:

`ADD !2 -NRIP ATN &10%080002030ef2`

The full-form command syntax:

```
SETDefault -IP CONTrol = ([ROute | NoROute], [RelaySrcRoute |
 NoRelaySrcRoute], [SplitLoad | NoSplitLoad], [Filtering |
 NoFiltering], [SECurity | NoSECurity], [FwdSubnetBcast |
 NoFwdSubnetBcast], [FwdAllSubnetBcast | NoFwdAllSubnetBcast])
```

can be shortened by abbreviating it to:

```
SETD -IP CONT = ([RO | NRO], [RSR | NRSR], [SL | NSL], [F | NF], [SEC
 | NSEC],[FSB | NFSB], [FASB | NFASB])
```

The following command uses this abbreviated syntax to enable IP routing, packet filtering, and security:

SETD -IP CONT = (RO, F, SEC)

Variations in Command Syntax

Each command has its own syntax. When a command is used for configuring parameters, its syntax or values may change according to the parameter and service. For example, the SETDefault command sets the NetMapTime parameter in the SYS Service and the MaxAge parameter in the STP Service. In the following example, the general syntax is followed by the syntax variations (different values for different parameters) appropriate to each parameter:

```
SETDefault <parameter> = <value>
SETDefault -SYS NetMapTime = <number>(0 to 120 seconds)
SETDefault -STP MaxAge = <second> (6-40)
```

Entering Service Names in Command Lines

When you are configuring or displaying parameters that appear in more than one service, you must provide a service name to distinguish them. You can enter the service name in abbreviated form, but the name must be preceded by a hyphen. For example, to indicate BRidge Service, type -BR.

Abbreviated service names are indicated in uppercase in this guide.

There are three exceptions:

- If you have previously set the CurrentServices parameter to the desired service, you do not need to enter the service name. The system prompt indicates the current service if you set a single service with the CurrentServices parameter. For information on using the CurrentServices parameter, refer to *Reference for NETBuilder Family Software*.

- Environment parameters do not have a service name. For descriptions of these parameters, refer to *Reference for NETBuilder Family Software*.

- You do not need to enter a service name when the parameter name is unique.

Determining the Display of Ports and Virtual Ports

You can control which ports are displayed in the output of the SHow and SHowDefault commands by setting the CurrentPorts parameter. If you have a bridge/router with several ports, for example a NETBuilder II bridge/router with multiport I/O modules installed, you may want to limit the display to information on certain ports instead of all ports. If you are interested only in displaying information for port 2 and virtual port V3, as well as the paths mapped to these ports, set the CurrentPorts parameter by entering:

SET CurrentPorts = (2, V3)

Now when you enter SHow and SHowDefault commands, only information for port 2 and virtual port V3, and the paths mapped to these ports, is displayed.

If you have a NETBuilder II bridge/router with a multiport module installed, you must enter its ports individually when setting the CurrentPorts parameter. For

instance, if you have an Ethernet 2-Port 10BASE-FL module, the A and B ports are distinct. If you specify port 1 with the CurrentPorts parameter, the software assumes you mean port 1A. For information on port and path numbering conventions for multiport modules, refer to Chapter 1 in *Using NETBuilder Family Software*. For more information about the CurrentPorts parameter, refer to *Reference for NETBuilder Family Software*.

The syntax convention for ports, virtual ports, and group ports is:

```
!<port>
```

For a port, <port> is a variable ID number, for example, !1. For a virtual port or group port, <port> is the letter V followed by a variable ID number, for example, !V1.

When you create a virtual port or group port, it functions in the same way as a port. Unless otherwise specified, the term "port" refers to virtual ports and group ports as well as ports. For more information on ports, virtual ports, and group ports, refer to Chapter 1 in Using NETBuilder Family Software.

Using Aliases

To avoid entering lengthy commands, you can create an alias to represent any command. To define an alias, use:

```
ADD –SYS ALias <alias name> <arguments…>
```

For example, if you use the SHow -SYS NetMAP command often, create an alias called ntmap by entering:

```
ADD -SYS ALias ntmap SHow -SYS NetMAP
```

When you want to display the network map, at the bridge/router prompt enter:

```
ntmap
```

For more information about aliases, refer to *Reference for NETBuilder Family Software*.

Command History Substitution

The bridge/router "remembers" the last 10 commands you enter. To display a list of these commands, at the bridge/router prompt enter:

```
SHow History
```

For more information refer to *Reference for NETBuilder Family Software*. Each command in the display is numbered. To repeat any of the commands, use the event designator, represented by an exclamation point (!).

You can use history substitution with the following options:

!!	Repeats the previous command.
!<n>	Repeats the command numbered <n>. For example, entering !100 repeats the command numbered 100. If you know the command number, you do not need to display it first.

!–<n>	Repeats the command whose number is the current command number minus <n>. The current command number is shown on the screen preceding the bridge/router prompt. For example, if the current command is 100 and <n> is 2, command number 98 is repeated.
!<string>	Repeats the most recent command that starts with the variable <string>. The SHow History command might display:

```
166 setdefault !1 -path control = enabled
167 show -path configuration
168 show history
169 set screenlength = 23
170 setdefault -bridge control = bridge
171 show statistics ?
```

If you enter !SETD at the prompt, the most recent occurrence of the SETDefault command is executed:

setdefault -bridge control = bridge

!?<string>	Repeats the most recent command containing <string>. In the preceding example, if you enter !?stat, the command show statistics ? (number 171) is executed. You can also repeat a previous command with modifications by using the syntax described next.
^<string1> ^<string1>^<string2>	Repeats the most recent command that contains <string1>. If <string2> is specified, it replaces <string1> in that command. For example, suppose you made a typing mistake when you entered the following SETDefault command:

seed welcomestring = "You are talking to the 3Com NETBuilder"

To repeat the command with the correct spelling of SETD, you do not need to reenter the entire command. Enter:

^seed^setd

The following command is then displayed and executed:

```
setd welcomestring = "You are talking to the 3Com NETBuilder"
```

Privilege Level

The privilege level determines which commands and parameters a user can access. The network manager must set the Network Manager password and the User password to be the same in order to provide equal levels of security. If only the Network Manager password is set, any other user receives User level privileges. Refer to "Changing the Password" on page 6-18.

You can change the privilege level with the SET PRIvilege command. For more information, refer to *Reference for NETBuilder Family Software*.

Command-Line Parameter Attributes

Parameter values, set members, and addresses can be expressed either as numbers or as text. This section provides guidelines for specifying numeric values, strings, and addresses. For details on the values permitted for each parameter, refer to *Reference for NETBuilder Family Software*.

Syntax for Assigning Values

Most parameters must be assigned a value of a particular type. Table 6-2 shows the possible types.

Table 6-2   Parameter Value Types

Type	Meaning	Example
Numbers	Represent the numerical value of a parameter.	15, 1024
Names	Usually represent either system-defined parameter or parameter values (written as *param-name* or *value*) or user-defined macros or files (written as *macroname* or *filename*).	Route, None
Strings	Some parameter values can be set to user-defined strings, ranging from a single character (written as *char*) to a multicharacter string (written as *string*).	"A," "B," "password"
Addresses	Two types of addresses can be assigned: media addresses for Ethernet, FDDI, token ring, and wide area protocols (SMDS, X.25, Frame Relay) and network layer addresses.	#311040800245, 129.213.24.30

The SET, SETDefault, and SYSgen commands require both parameter names and parameter values. The parameter name is followed by an equal sign (=) and a value. Spaces are permitted, but not required, before and after the equal sign, for example:

```
SETDefault -SYS ScreenLength = 30
```

The ADD and DELete commands also require both parameter names and parameter values. These commands modify sets of objects. No equal sign precedes the value that is added or deleted as a set member, for example:

```
ADD -IP ADDRess 10.0.0.1 %080002001234
```

Numeric Values

To assign a hexadecimal value to a parameter, precede the number with a percent sign (%). Alphabetic characters can be entered in upper- or lowercase letters.

To assign a decimal number, type the number without any preceding symbol.

Names

To assign a name, type the name in the command. Names, unlike strings, do not require quotation marks; however, the character length of the name may be limited.

Strings

String values fall into two categories: single characters and variable-length strings. Table 6-3 lists the conventions for entering string values.

Table 6-3   Conventions for Entering Strings

String Type	Characters	Valid Characters	Examples
Single characters	Enclose in apostrophes.	All alphanumeric characters and symbols	'S', 's','$'
Variable-length strings	Enclose in quotation marks.	All alphanumeric characters and symbols	"Hello!"

Characters in a string are case-sensitive. For example, "ABC" is different from "abc."

A few characters have special meaning to the bridge/router and must be preceded by a backslash (\) in string text to prevent them from being misinterpreted. These symbols are the apostrophe ('), backslash (\), caret (^), and quotation mark ("). For example, to include an apostrophe in string text, enter a backslash followed by an apostrophe (\'). To include a backslash (\) in string text, enter two backslashes (\\). The first backslash prevents the bridge/router from treating the second as a special character.

When specifying AppleTalk zone strings, you can use the extended AppleTalk ASCII character set. For more information, refer to *Using NETBuilder Family Software.*

You can assign a string to the PATH NAme parameter, and use this string as an instance identifier. For example, you can assign the name "testnet" to path 2 by entering:

SETDefault !2 -PATH NAme = "testnet"

In subsequent path-specific commands, you can substitute the path name for !2. For example, if you want to set the connector type on path 2 after assigning a name to this path, enter:

SETDefault !testnet -PATH CONNEctor = RS232

This same feature is available for port-specific commands. You can assign a name to a port and then substitute the port name for !<port> in subsequent commands. To assign a name to a port, use:

```
SETDefault !<port> -PORT NAme = "<string>"
```

For more information on the NAme parameter, refer to *Reference for NETBuilder Family Software*.

Port and Path Naming Restrictions

Port and path names are subject to the following restrictions:

- The name string can contain a maximum of eight characters, the first of which must be alphabetic.

- No blank spaces are allowed. The only nonalphanumeric characters allowed are the asterisk (*), underscore (_), period (.), and hyphen (-).

- Two ports or two paths cannot have the same name, but a port name can be the same as a path name.

- Alphabetic characters are stored and displayed as entered. Names are case-insensitive when compared with previously entered names. For example, port2 and PORT2 are evaluated as the same name.

ISDN-Related Syntax Variation   The syntax for some parameters is different for built-in Integrated Services Digital Network (ISDN) interfaces. The syntax variation for these parameters is presented in *Reference for NETBuilder Family Software* in the following format:

For non-ISDN interfaces
```
SETDefault !<path> -PATH remoteDialNo = "<string>"
SHow [!<path> | !*] -PATH remoteDialNo
SHowDefault [!<path> | !*] -PATH remoteDialNo
```

For built-in ISDN interfaces
```
SETDefault !<connectorID.channelID> -PATH remoteDialNo = "<string>"
SHow [!<connectorID.channelID> | !<connectorID>.*] -PATH
 remoteDialNo
SHowDefault [!<connectorID.channelID> | !<connectorID>.*] -PATH
 remoteDialNo
```

The syntax variation for non-ISDN interfaces applies to local area network (LAN) and data terminal equipment (DTE) interfaces.

NETBuilder software menus and help strings do not display the syntax variation for ISDN interfaces.

The variation in syntax is caused partially by the different path-numbering convention used for ISDN. For information, refer to *Using NETBuilder Family Software.* Special parameter values related to built-in ISDN interfaces can also cause a variation in syntax.

Some parameters in ISDN-specific software are connector-related and require that you specify a connector number (<connectorID>), for example, 2. Other parameters are channel-related and require that you specify both a connector and a channel number (<connectorID.channelID>), for example, 2.1. When you specify both a connector and a channel number, you must separate them with a decimal point.

If you do not specify a channel number in a command that requires both a connector and a channel number, the software assumes the first channel associated with the connector. For example, if you specify connector number 2 when the syntax requires that you to specify both a connector and a channel number, the software assumes you mean 2.1.

To specify all channels associated with a connector, specify the connector number, a decimal point, and an asterisk, for example, 2.*

Address Formats   The following summary describes media addresses and network layer addresses the bridge/router uses and their formats. For detailed information on protocol-specific addressing, refer to *Reference for NETBuilder Family Software.*

Media Addresses

MAC   Contains 12 hexadecimal digits preceded by a percent sign (%). The NETBuilder II bridge/router has a media access control (MAC) address (physical) for each LAN interface (Ethernet, FDDI, or token ring), for each HSS interface, and for the CEC module.

The MAC address and the network identifier constitute a network address, which is the only address used by Xerox Network Systems (XNS) and Internetwork Packet Exchange (IPX) routers. IP routers have both MAC addresses for their LAN interfaces and Internet addresses for their configured ports. Internet addresses are described in "Network Layer Addresses" on page 6-14.

Each MAC address is assigned by 3Com. A MAC address can be displayed by entering:

SHow -SYS ADDRess

The following is an example of a MAC address:

%080002001326

Frame Relay Requires an address called a Data Link Connection Identifier (DLCI). DLCIs are assigned by the appropriate authority at subscription time. A DLCI follows an at sign (@) and can range from 1 through 1022 decimal. The DLCI identifies a virtual circuit on the Frame Relay network, and is used by the local bridge/router to send a packet to a router on the other end of the circuit. The following is an example of a Frame Relay address:

@22

In the standard (local) addressing convention, the DLCI number has only local significance; a duplicate number can be used by other bridge/routers. In the global addressing convention, identifiers used throughout the Frame Relay network are unique, and all traffic to a node has the same destination DLCI number.

ATM Consists of an 8-bit virtual path identifier (VPI) and a 16-bit virtual circuit identifier (VCI), usually represented in VPI.VCI format, where VPI is a decimal number between 0 and 255 and VCI is a decimal number between 0 and 65,535. The following is an example of an Asynchronous Transfer Mode (ATM) address:

107.44

Some vendors' DSUs require an ATM address that consists of a 0-bit VPI and a 10-bit VCI. In this case, the 10-bit VCI maps directly to a Frame Relay DLCI.

SMDS There are two types of Switched Multimegabit Data Service (SMDS) addresses: individual addresses, for unicast traffic, and group addresses, for multicast traffic. An individual address routes data to a unique node. Packets sent to a group address are delivered to all nodes that share that address. Both types of address begin with a dollar sign. They are distinguished by the first or control digit: hexadecimal C for an individual address and hexadecimal E for a group address. Each address has 15 decimal digits following the control digit and resembles a telephone number. The software automatically right-pads shorter addresses with hexadecimal F to the full length. The following are examples of individual and group SMDS addresses:

C14085551212FFFF   Individual Address

E14085551234FFFF   Group Address

X.25 Consists of up to 15 decimal digits and can vary in length. The address looks similar to a telephone number and is preceded by a pound sign (#). An X.25 address is also referred to as a data terminal equipment (DTE) address.

When a device is attached to a public data network (PDN), the network provider assigns it an X.25 address or an international data number (IDN). The first four digits indicate the country and PDN to which the device is attached. The remaining digits represent a unique device address determined by the network provider. The following is an example of an X.25 address:

#311041503333

ISDN	An ISDN address is a phone number provided by your telecommunications carrier. It can include a dial prefix, country code, area code, and phone number. It can consist of a maximum of 30 characters. If you create a subaddress, you must separate the phone number and the subaddress with a semicolon (;). The subaddress can be composed of a maximum of 20 characters.

The following is an example of a valid ISDN address, including a subaddress:

011122134567000;200

For complete information on ISDN addresses, refer to *Using NETBuilder Family Software*.

Network Layer Addresses

AppleTalk	Consists of the network number and node ID. Each AppleTalk node address is unique throughout the AppleTalk Internet. For details on assigning an AppleTalk address, refer to *Reference for NETBuilder Family Software*. The following is an example of an AppleTalk address: 4.23
DECnet	Consists of an area address and a node address. The area number identifies the area to which the router belongs. Enter an area number between 1 and 63. The node number assigned to the router must be unique within the area. Enter a node number between 1 and 1,023. For details on assigning a DECnet address, refer to *Reference for NETBuilder Family Software*. The following is an example of a DECnet address: 1.15
Internet	Also known as an IP address. It consists of up to 12 decimal digits arranged in four three-digit fields separated by periods, as shown in the following format: xxx.xxx.xxx.xxx Leading zeros can be omitted. For example, the following addresses are the same: 010.002.002.001 10.2.2.1 An Internet address is required for:

- A bridge/router port to perform IP routing
- The bridge/router to be accessed via Telnet
- The bridge/router to respond to the PING command from another host
- The bridge/router to participate in SNMP-based network management

An address includes both a network number and a host number. The actual format of these numbers varies depending on the class of address being designated. Address class is determined by the value in the first octet of the address.

Table 6-4 shows valid address classes, the range of the first address field, and the resulting address format. The maximum value for any single field is 255.

Table 6-4   Internet Address Format

Class	Range of First Address Field	Address Format
A	0–127	nnn.hhh.hhh.hhh[*]
B	128–191	nnn.nnn.hhh.hhh[*]
C	192–223	nnn.nnn.nnn.hhh[*]
D	224–239	yyy.yyy.yyy[†]

[*] n represents a digit of the network number; h represents a digit of the host number.
[†] Class D addresses are used for multicast applications as assigned by the Internet Assigned Numbers Authority (IANA).

For more information on Internet addresses, subnet masks, and variable length subnet masks, refer to *Using NETBuilder Family Software.*

IPX
Leading zeros can be omitted. Consists of an ampersand (&) followed by a network address, which contains eight hexadecimal digits, followed by the MAC address.

You may need to enter an IPX address when using the bridge/router for IPX routing. The network address uniquely distinguishes one IPX network from all other IPX networks. The following example addresses are the same:

&00003333%080002005678

&3333%080002005678

OSI
Open System Interconnection (OSI) network addresses are called network service access points (NSAPs). NSAPs are of variable length and format, although they are always considered to have the following three parts:

- Area address (variable length)
- System ID (six octets)
- N-selector (one octet)

The system ID and N-selector are the last seven octets of the MAC address, and the area address is everything but the system ID and N-selector. The following is an example of an OSI address:

/49/0053080002A0089D01

where the area address is: /49/0053

the system ID is: 080002A0089D

and the N-selector is: 01

For more information on the OSI addressing scheme, OSI routing domains, and area addresses, refer to *Using NETBuilder Family Software.*

VIP
A VINES Internet Protocol (VIP) address is globally unique, fixed, and permanent for servers and routers only. Each node has a two-field, 48-bit Internet address, which is derived from the 32-bit VINES network number and the 16-bit subnetwork number.

The Internet address has eight hexadecimal digits (VIP network ID) and four hexadecimal digits (subnetwork ID) separated by a colon (:). The Internet address (logical network) is independent of any data link layer address assigned to a node on a physical medium. The following is an example of a VIP address:

02A01339:0001

XNS   Consists of a network address followed by a MAC address. The network address distinguishes between different XNS Ethernet networks. It contains eight hexadecimal digits, and is preceded by an ampersand (&), which is used for identification. Leading zeros can be omitted. The following addresses are the same:

&3333%080002001326

&00003333%080002001326

Getting Help

The user interface provides help menus as memory aids. To display the help menu, enter a question mark (?). The question mark can be used with different options as described in Table 6-5.

Table 6-5   Online Help Syntax Summary

Syntax	Description
?	Displays the help menu. Different commands are displayed depending on whether Network Manager privilege or User privilege is in effect. The commands are organized according to services.
-?	Displays a list of services.
-service?	Displays a list of commands within the service.
	For example, to display a list of commands in the SYS Service, enter:
	-SYS?
	If there are no commands under the service, a message is displayed to indicate this. For example, enter this command at the prompt:
	-IDP?
	A message similar to the following appears:
	`No commands available in IDP service`
command -service?	Displays a list of parameters that can be used with the command within the service.
	For example, to display a list of PORT Service parameters that can be used with the SETDefault command, enter:
	SETDefault -PORT?
command ?	Displays parameters by service name that can be used with the command. Only parameters in services specified by the CurrentServices parameter are displayed.
command -service parameter?	Displays syntax for the command used with the parameter.
	For example, to display the syntax for the SETDefault command used with the CONTrol parameter in the SNMP Service, enter:
	SETDefault -SNMP CONTrol?

Setting up IP Routing

You must set up the port that accesses the server for IP routing. To set up IP routing, follow these steps:

1   Log on as root and press the Return key.

The password prompt is displayed.

2   At the password prompt, press the Return key.

The network manager prompt (NETBuilder #) is displayed.

3   Set up an IP address and subnet mask using:

`SETDefault !<port> -IP NETaddr = <IP address> [<subnet mask>]`

For more information on IP configuration, refer to *Reference for NETBuilder Family Software.*

4 Enable IP routing by entering:

SETDefault -IP CONTrol = RO

5 Enable a routing protocol. For example, to enable RIP use:

SETDefault !<port> -RIPIP CONTrol = (Listen, Talk)

This step is optional.

6 Ensure your configuration by verifying that the bridge/router can access other devices on the network, use:

PING <IP address>

where <IP address> is the IP address of another device on the network.

Storing Configuration Parameter Values

Configuration parameters are stored in flash memory or on the disk of another server (for example, the TFTP/FTP server that boots the bridge/router). In this guide, the term "disk" refers to either the local flash memory drive or the hard disk on another server.

When the bridge/router is booted, it copies configuration parameters from the disk to memory. Parameter values on the disk are *default values* and values in memory are *active values*. You can alter the default and active values with the SETDefault and SET commands. For more information, refer to *Reference for NETBuilder Family Software*.

When the new value of a parameter takes effect depends on whether its active value has been changed. Some commands change the active value only, some change the default value, and some change both. If you display the parameter after modifying it and see the new value, the new value has taken effect immediately. If a command changes only the default value, the new value takes effect only after reboot. In this guide, if the description does not specify when the new value of a parameter takes effect after being enabled or disabled, it is effective immediately after it is set.

Obtaining Network Manager Privilege Level

Before changing the Network Manager password, you must obtain Network Manager privilege.

To display or change the privilege level, follow these steps:

1 To determine the current privilege level, enter:

SHow PRIvilege

If the following message is displayed, you already have Network Manager privilege:

PRIvilege = NetMgr

If the following message is displayed, go to step 2:

PRIvilege = User

You also can determine the privilege level from the NETBuilder prompt. The following prompt is displayed at the Network Manager privilege level:

NETBuilder #

The following prompt is displayed at the User privilege level:

```
NETBuilder >
```

2 If you are currently at User privilege level, enter the following command to change the privilege level from User to Network Manager:

SET PRIvilege = NetMgr

The following prompt is displayed:

```
Password:
```

3 Press the Return key.

A null string is entered, which is the default password.

After obtaining Network Manager privilege, proceed to the next section to change the Network Manager password.

Changing the Password

Changing the Network Manager password prevents unauthorized users from accessing the bridge/router. You should change the password immediately after you log on for the first time.

The privilege level determines which commands and parameters a user can access. Each level has its own password. You must set the Network Manager password and the User password to be the same in order to provide equal levels of security. If only the Network Manager password is set, any other user receives User level privileges.

Users with NetMgr privileges can lower their privileges without a password. Users with User privileges cannot raise their privileges. To raise privileges after lowering them, you must enter the password again.

The Network Manager password must be set before the User password. The User password must be cleared before the Network Manager password.

To change the password, follow these steps:

1 At the NETBuilder prompt (NETBuilder #), enter:

SysPassWord

When a menu is displayed, Select 1, Set Network Manager Privilege Password.

2 Enter the new Network Manager password. Retype it when prompted to do so.

You are returned to the SysPassWord menu.

3 Enter 2.

4 Enter the new User password and retype it when prompted to do so.

5 Press the Return key to exit the SysPassWord menu and return to the NETBuilder prompt (NETBuilder #).

Go to the next section to set the time and date on the system.

Setting the Time and Date

To set the time and date on your system, use:

```
SET -SYS DATE = YY/MM/DD HH:MM[:ss]
```

For example, to set the date and time to January 10, 1995, 9:40 a.m., enter:

SET -SYS DATE = 1995/1/10 09:40

The NETBuilder II bridge/router contains a real-time clock, so you do not need to set the date after each reboot to keep it correct.

For more information on these parameters, refer to *Reference for NETBuilder Family Software*. Proceed to the next section to enter system administrator information.

Setting System Administrator Information

As system administrator, you can set the system name, location, and system contact so that other system administrators can contact you for information. If you are planning to use SNMP, you must set the system administrator information; otherwise, these settings are optional.

Before performing the procedure, you need to decide on or obtain the following information:

- System name
- System location
- System contact person and phone number

To set system administrator information, follow these steps:

1 Specify a name for the node, using:

SETDefault –SYS SysNAMe = "<string>"

For example, to set the bridge/router name as " Sales.SanJose," enter:

SETDefault -SYS SysNAMe = "Sales.SanJose"

The system name can contain no more than 255 characters. The default value is " " (null string).

2 Specify the system location, using:

SETDefault –SYS SysLOCation = "<string>"

For example, to set the system location as " SecondFloor.Lab," enter:

SETDefault -SYS SysLOCation = "SecondFloor.Lab"

The system location can contain no more than 255 characters. The default value is " " (null string).

3 Specify a string that identifies the contact person managing the bridge/router, using:

SETDefault –SYS SysCONtact = "<string>"

For example, to specify John Smith as the system contact and a number to reach him, enter:

SETDefault -SYS SysCONtact = "John Smith (408) 555-1111"

The system contact string can contain no more than 255 characters. The default value is " " (null string). Users can obtain this information by entering:

SHow -SYS SysCONtact

Proceed to the next section to assign an Internet address.

Assigning Internet Addresses

This section describes how to assign one or more Internet addresses to the system using the NETaddr parameter in the IP Service. Before you assign an Internet address, you must determine:

- Whether you want your network to connect to the Internet, and how to obtain a unique Internet address.
- Whether you want to use the system as a bridge, a router, or a bridge/router.
- Whether you need subnet addressing.

If you have already decided on these issues, proceed to "Assigning Internet Addresses to a Bridge" on page 6-20 or to "Assigning Internet Addresses to a Router" on page 6-21. If you need more information to make your decision, refer to "Obtaining an Internet Address" on page 6-21 and to the subnet information in the *Using NETBuilder Family Software*.

Assigning Internet Addresses to a Bridge

Even though a bridge does not route IP traffic, it needs an Internet address to participate in network management and to be accessible from other devices through Telnet or the SNMP.

When assigning an Internet address to an entire bridge, assign the address to port 0 using:

```
SETDefault !0 –IP NETaddr = <IP address>
```

An Internet address assigned to port 0 is considered an Internet address for the entire bridge.

The following example illustrates how to assign an Internet address to a bridge.

Example   Figure 6-3 shows a configuration in which you need to assign an Internet address to a bridge. Hosts A and B are two hosts belonging to the same IP network, network 10. The IP host on Network A has an Internet address 10.0.0.1, and the one on Network B has an Internet address 10.0.0.2. The bridge forwards packets between these segments. To allow communication between the hosts and the bridge, ports 1 and 2 must reside on the same network. Assigning the same network number to two or more bridge ports is prohibited, so you must assign the address to the entire bridge, entering a command similar to the following:

SETDefault !0 –IP NETaddr = 10.0.0.3
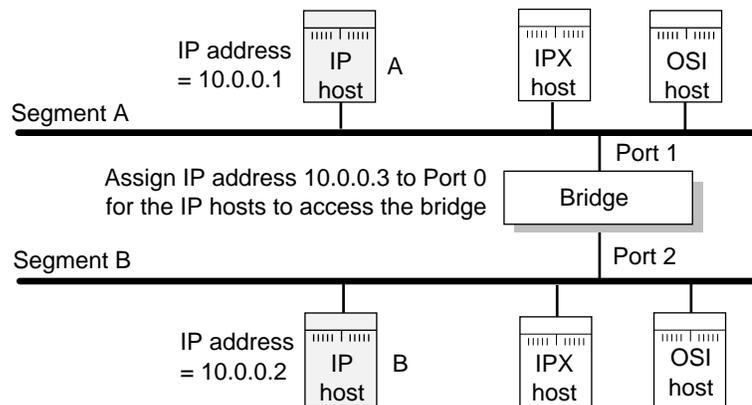
Figure 6-3   Assigning an IP Address to the Entire Bridge

After assigning an Internet address to the bridge, proceed to Chapter 1 in the *Using NETBuilder Family Software*.

Assigning Internet Addresses to a Router

If the bridge/router is used to route IP traffic, you must configure the ports on which IP packets are routed by assigning Internet addresses to them. You can assign Internet addresses to individual ports using:

```
SETDefault !<port> -IP NETaddr = <IP address>
```

For more information, refer to the *Reference for NETBuilder Family Software.*

⚠ *CAUTION: Do not assign an Internet address to port 0, or the IP routing function will be disabled.*

The next example illustrates how to assign Internet addresses to a bridge/router.

Example   In Figure 6-4, Networks A and B are two different IP networks, and the bridge/router is used for routing IP packets and for bridging OSI packets. To assign an IP address to port 1, enter a command similar to the following:

SETDefault !1 -IP NETaddr = 192.1.5.1

To assign an address to port 2, enter a command similar to the following:

SETDefault !2 -IP NETaddr = 192.1.3.1
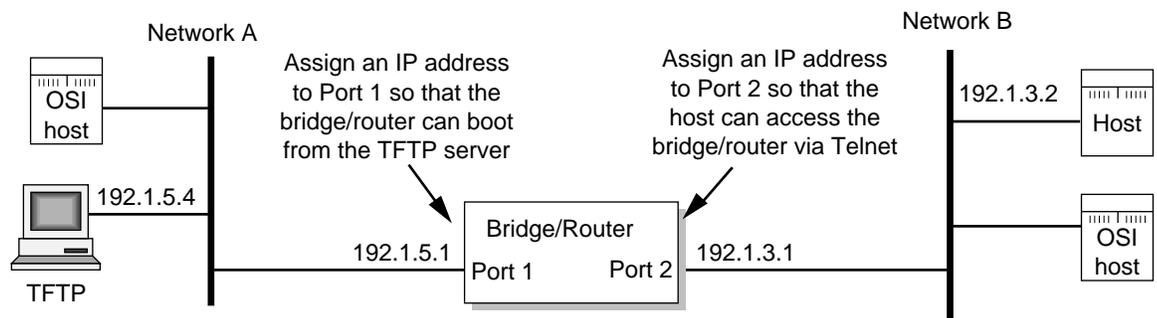
Figure 6-4   Assigning an IP Address to a Bridge/Router Port

For additional information on Internet addresses and subnet masks, refer to *Using NETBuilder Family Software.* After assigning an Internet address or addresses to the bridge/router, proceed to Chapter 1 in *Using NETBuilder Family Software.*

Obtaining an Internet Address

If you want to connect your TCP/IP network to the Internet, you must obtain a unique address from the central authority, the InterNIC. This central authority provides the following services:

■ Registration Services

   Assists in registering networks and domains, and assigns network numbers and other entities to the Internet community.

■ Directory and Database Services

   Maintains lists of FTP sites, various types of servers available on the Internet, white and yellow page directories, library catalogs, and data archives. For more information, phone (908) 668-6587 or use network mail (admin@ds.internic.net).

■ Information Services

   Offers information about how to get connected to the Internet, pointers to network tools and resources, and seminars on various topics held in locations around the country. For more information, phone (800) 444-4345 or use network mail (info@internic.net).

The Registration Service of the InterNIC assigns a globally unique network number, leaving responsibility for assigning a unique local host number to the network administrator.

To obtain a unique Internet address, contact the following organization:

Network Solutions
Attn: InterNIC Registration Services
505 Huntmar Park Drive
Herndon, VA 22070
1-703-742-4777
800-444-4345 (Referral Desk)
Network mail: HOSTMASTER@RS.INTERNIC.NET

For customers in Europe (including the former Soviet Union and the Middle East), contact the Reseaux IP European (RIPE) Network Coordination Center in the Netherlands using telephone number 3120592 5065.

All other customers abroad should contact Network Solutions at the telephone number given above for assistance in locating network providers in your region.

If you do not plan to be connected to the Internet, you can assign network addresses on your own. However, if you plan on accessing the Internet in the future, you may want to apply for an Internet network address so you will not have to change network addresses when you make the connection.

After obtaining your Internet address, refer to "Assigning Internet Addresses to a Bridge" on page 6-20 or to "Assigning Internet Addresses to a Router" on page 6-21. For additional information on Internet addresses and subnets, refer to *Using NETBuilder Family Software*.

Setting Up the Simple Network Management Protocol

The NETBuilder II bridge/router participates in different types of network management activities. Most management activities require configuration because they are disabled by default. The bridge/router manages networks in the following ways:

- Configuring and monitoring from a UNIX or Windows network management station using Transcend Enterprise Manager

- Remote upgrade management using the NETBuilder Remote Upgrade Management Utilities supplied on CD-ROM with every NETBuilder release

- Building network maps (netmaps)

This guide does not describe in detail how to set up the SNMP Service. Refer to *Using NETBuilder Family Software* and *Reference for NETBuilder Family Software* for more information.

SNMP allows you to modify and display some NETBuilder parameters from a network management station. You do not need to attach a terminal to the bridge/router console port to change its configuration. To implement SNMP, follow specifications in RFC 1155, RFC 1157, and RFC 1213. System parameters described in RFC 1213 and 3Com extended parameters can be accessed from the host.

Modifying SNMP Parameters	To enable SNMP read/write access, you need to modify two parameters in the SNMP Service: COMmunity and MANager.

The COMmunity parameter is an SNMP Service parameter that modifies the list of communities. For information on how to use the COMmunity parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software.*

By default, the community name "ANYCOM" exists with read access to the management information base (MIB) variables and allows unrestricted access to the bridge/router. To ensure that access is available only to the proper system administrator, 3Com recommends that you delete the "ANYCOM" community name, and add the appropriate community string and the IP address of the manager.

To modify SNMP parameters, follow these steps:

1 Delete the default community string "ANYCOM" by entering:

```
DELete -SNMP COMmunity "ANYCOM"
```

2 Configure at least one new community string with read/write access.

For example:

```
ADD -SNMP COMmunity "private" TRiv RW AL1
```

3 Add other community strings with read-only access as required.

For example:

```
ADD -SNMP COMmunity "public" TRiv RO AL1
```

4 Create a new manager with read/write access to the NETBuilder bridge/router. For security reasons, limit the number of network management stations.

For example:

```
ADD -SNMP MANager "private" 129.213.224.1 255.255.0
```

5 Enable the SNMP service by entering:

```
SETDefault -SNMP CONTrol = (Manage, Trap)
```

NETBuilder Security

NETBuilder security can be obtained many ways including limiting the access to a particular network or by limiting the access to certain files. Limiting access to a particular network can be accomplished by building Internet firewalls. Limiting access to particular files can be accomplished by using certain commands and parameters.

Building Firewalls for Security

A firewall allows users inside a private network to have outbound access, while restricting outside users from inbound access. For more conceptual information about firewall and its capabilities, and details on how to configure firewalls, refer to *Using NETBuilder Family Software*. For a description and syntax of the various firewall service parameters, refer to *Reference for NETBuilder Family Software*.

Security Commands and Parameters

To make sure that some designated files are accessible only to the system administrator, use the following commands and parameters:

- NetAccess

  This parameter is a SYS Service parameter that determines how a bridge/router can be accessed from another device on the network. For information on how to use the NetAccess parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software.*

- SysPassWord

  This command brings up a menu allowing you to specify the password for the Network Manager and User privilege levels. For information on how to use the SysPassWord command, refer *Reference for NETBuilder Family Software.*

- RemoteManager

  This parameter is a SYS Service parameter that specifies the Internet addresses of devices that can connect to the bridge/router through the REMote command. For information on how to use the RemoteManager parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software.*

- COMmunity

  This parameter is an SNMP Service parameter that modifies the list of communities. For information on how to use the COMmunity parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software.*

What Next?

You are now ready to refer to *Using NETBuilder Family Software* to configure your bridge/router for your specific network needs.

A
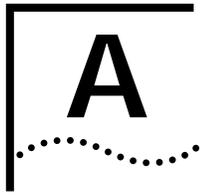
BOOTING THE NETBUILDER II CEC 20 SYSTEM FROM THE NETWORK

Booting from a TFTP/FTP Server

If you do not have a flash memory drive or want to manage the software for one or more bridge/routers on a centralized server, you can boot from a Trivial File Transfer Protocol (TFTP) server. Configuration files can be accessed from the same workstation running a File Transfer Protocol (FTP) server program.

> *Network boot is not supported by the NETBuilder II bridge/routers with the DPE modules installed.*

When you set up your NETBuilder bridge/router for network boot, you must configure your bridge/router to boot from a particular server by specifying the IP address of that server to the bridge/router. If you do not want to specify a particular server, you may configure your NETBuilder II bridge/router to use BOOTP, which discovers available TFTP servers on the local network by broadcasting BOOTP request packets. For more information about BOOTP, refer to *Reference for NETBuilder Family Software.*

Installing NETBuilder Software on the UNIX-based Network Management Station

This section describes how to install NETBuilder II bridge/router software on a UNIX-based network management station.

Prerequisites

To install the NETBuilder II bridge/router software image from a CD-ROM, the CD-ROM drive must reside either locally on the network management station or on another system on the network.

Before installing version 10.1 software from a CD-ROM, check that:

- Your network management station is running Solaris 2.4 or 2.5x, SunOS 4.1.4, HP-UX 9.0.5, 10.10 or 10.20, or IBM AIX 3.2.5, 4.1.4 or 4.2.

  To verify the operating system environment you are running, enter:

  uname –a

  The version message will refer to Solaris 2.5x as SunOS 5.5.

- You know the root password.

- There is sufficient disk space on the network management station for the amount of software you are installing.

  Minimal disk storage requirements are dependent on the number of NETBuilder systems being installed. For dual image support allocate 40 MB for the NETBuilder Upgrade Management Utilities software image. For single image support, allocate 4 MB for each NETBuilder II system.

- The NETBuilder Upgrade Management Utilities released with this software package have been installed on the network management station. Refer to *Upgrading NETBuilder Family Software* for more information.

Installing NETBuilder Software on the UNIX NMS

To install the NETBuilder software, follow these steps:

1 Ensure that the TFTP server on the network management station is running and has been correctly configured.

2 Mount the version 10.1 software CD-ROM on the network management station. For mount instructions for your specific UNIX operating system, refer to *Upgrading NETBuilder Family Software*.

3 Set environmental variables with the location of NETBuilder Upgrade Management Utilities. (These variables depend on the UNIX shell that is installed at your site.)

■ If you are using a C-shell (csh), at the prompt enter:

   source /usr/3Com/common/data/.login-bcm

■ If you are using a Bourne (sh) or Korn (ksh) shell, at the prompt enter:

   . /usr/3Com/common/data/.profile-bcm

4 Ensure that you are using the version of the NETBuilder Upgrade Management Utilities that shipped with your software upgrade. To check the version you have installed, enter:

bcmdiagnose -h

The version of the installed utilities is displayed in the following message:

bcmdiagnose version 10.1. Copyright 3Com Corporation 1996

If the version of the utilities you have installed differs from the version shipped with your software package, you must first install the utilities shipped with your software package.

i *In the next step, the bcminstall utility extracts the files from the CD-ROM and installs them on the network management station hard disk in the /tftpboot/image/<platform>/ SW|FW/<version> /<pkg> directory. For example, the software may be installed in the /tftpboot/image/NBII/SW/101/FF directory. If there is insufficient space on the disk, you can link /tftpboot to another disk.*

5 Using the NETBuilder Upgrade Management Utilities, install the NETBuilder software from the CD-ROM (the default) by entering:

bcminstall

i *The optional path parameter may also be used to install on a network management station that has two or more drives connected as well as for installing from a remote CD-ROM drive. You must explicitly specify the second CD-ROM drive.*

To install a NETBuilder package from a second CD-ROM drive on a Solaris machine, enter:

bcminstall -cdrom /cdrom/cdrom1/image

After the installation is complete, the screen shows an inventory of all NETBuilder packages installed, including previous versions you have installed.

Setting Up a Unique Configuration File Directory on a TFTP/FTP Server	The NETBuilder II system accesses both configuration files and multiprocessor (MP) images from a unique directory on the network management station using TFTP. MP images (MP6e.29k or MPatm) are always in /TFTPboot/image/NBII/SW/<release>/FF. Configuration files on the network management station exist only when the user does a bcmbackup and they are always stored in the following directory:

/tftpboot/image/<platform>/sw/version<package>.

To set up this unique directory, follow these steps:

1 For each NETBuilder II bridge/router, you must create a directory for these files with appropriate read/write permissions.

For example, enter:

```
mkdir /tftpboot/configs/101/NBIICA
```

2 If your NETBuilder II bridge/router is using MP modules, you must copy these images from the location on the network management station where they were installed during the CD-ROM installation procedure.

These files are mp6e.29k and mpatm.29k. They reside in a default directory represented by /tftpboot/image/NBII/SW/<version>/<pkg>.

For example, to use the 6-Port Ethernet module, enter:

```
cp /tftpboot/image/NBII/SW/101/FF/mp6e.29k
/tftpboot/configs/101/NBIICA
```

Setting the Primary Boot Source	Set up the boot source to be a TFTP/FTP server accessed over a single Ethernet port or FDDI port (FDDILink ports are not supported).

See Table A-1 for additional boot source parameter settings, such as those related to booting over a token ring port, an HSS port using PPP, or a multiport Ethernet module.

To set the primary boot source, follow these steps:

1 From the NETBuilder monitor prompt, enter:

```
SF
```

The System Configuration menu is displayed.

2 Select the Primary Boot Source option.

The Primary Boot Source menu is displayed.

3 Select the Boot Device option, and set the Boot Device to Network.

You are then prompted to set the slot number and boot filename.

4 Enter the slot number of the module that is used to reach your TFTP server.

If you have a 4-Slot chassis, your options are 1 through 4. If you have an 8-Slot chassis, your options are 1 through 8.

5 Enter the boot filename by entering the directory path and filename relative to the "tftpboot" directory where the CEC 20 boot image resides.

For example, enter:

```
/image/NBII/SW/101/FF/boot.29k
```

6 Enter Q to return to the Primary Boot Source menu.

7 Enter 2 and set the Primary Config File Source to Boot Device.

You will be prompted for the Default directory for your configuration files.

8 Enter Q to return to the Primary Boot Source menu.

9 Select the Boot Protocol option, and set the Primary Boot Protocol to TFTP.

You are then prompted to set the TFTP Address Discovery Protocol.

10 Enter Q to return to the Primary Boot Source menu.

11 Select the IP Addresses option, and enter the primary IP addresses assigned to your client, boot server, gateway, remote file server, and subnet mask.

12 Enter Q twice to return to the Primary Boot Source menu.

13 Select the FTP Login option, and enter the username and password to be used by FTP.

The password is not displayed on the console when you type it.

14 Exit the SysconF menu system by typing Q repeatedly.

15 Reboot the system by simultaneously pressing both Reset buttons on the front panel, or by typing RS at the monitor prompt.

More Boot Options   Table A-1 summarizes other parameters you may need to configure, including parameters you need to boot from a TFTP server over a token ring port, HSS port using PPP, or multiport Ethernet module.

Table A-1   Additional TFTP Primary Boot Source Parameters

Parameter	Configuration
Boot Device: Network	Interface Number
	You are prompted with this field only if an Ethernet 2-Port or Ethernet 6-Port module resides in the slot. Make sure this parameter is set to the appropriate interface (A or B or A–F). The default is A.
MP Module Parameters	You need to configure this parameter only if the TFTP server is reachable through an HSS port running PPP or a token ring port.
	HSS port running PPP
	If your boot source is reachable through an HSS port running PPP, you are prompted to configure the following fields:
	■ HSS Baud Rate This setting must correspond to your serial line setting.
	■ HSS Clock Source Set this parameter appropriately (the default setting is external).
	■ HSS Connector Type Set this parameter to the connector that the server is reachable through (the default is V.35).
	■ HSS Protocol Select PPP.
	■ HSS WAN Password Leave this field empty.

(continued)

Table A-1   Additional TFTP Primary Boot Source Parameters (continued)

Parameter	Configuration
	Token ring port
	If your boot source is reachable through a token ring port, you are prompted to configure the following field:
	■ Token Ring Speed This setting must correspond to the token ring line setting (the default is 4 Mbps). ■ Token Ring Baud Rate Make sure the setting of this field matches that of your token ring line.
Boot Protocol	Make sure the Boot Protocol is set to TFTP.
	If you are configuring your bridge/router to use TFTP only, set the Address Discovery Protocol to Local Configured Addresses.
	If you are configuring your bridge/router to use TFTP and BOOTP, set the Address Discovery Protocol to BOOTP.
Boot Sources	Make sure the Boot Sources are set to Primary and Secondary.
MAC Address	Make sure this parameter is set to the CEC 20 MAC address.
ARP Format	If your boot source is reachable through a token ring port, make sure that the setting of this parameter agrees with the Address Resolution Protocol (ARP) format used on your token ring network: noncanonical.

What Next?   You may set up the Simple Network Management Protocol (SNMP) to allow network management of the bridge/router. For information on this service, refer to "Setting Up the Simple Network Management Protocol" on page 6-22.

Refer to Chapter 6 to configure basic settings.

To set other boot options, refer to the SysconF appendix in *Reference for NETBuilder Family Software*.

B
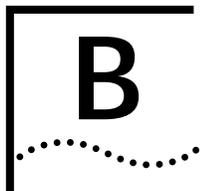
TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, we recommend that you access 3Com Corporation's World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Bulletin Board Service (3ComBBS)
- 3ComFacts℠ automated fax service
- 3ComForum on CompuServe online service

World Wide Web Site

Access the latest networking information on 3Com Corporation's World Wide Web site by entering our URL into your Internet browser:

http://www.3com.com/

This service features the latest information about 3Com solutions and technologies, customer service and support, news about the company, *Net Age®* Magazine, and more.

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 547 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5608
Italy (fee required)	up to 14400 bps	39 2 27300680
Japan	up to 14400 bps	81 3 3345 7266

(continued)

Country	Data Rate	Telephone Number
Mexico	up to 28800 bps	52 5 520 7853
P.R. of China	up to 14400 bps	86 10 684 92351
Singapore	up to 14400 bps	65 534 5693
Taiwan, R.O.C.	up to 14400 bps	886 2 377 5840
U.K.	up to 28800 bps	44 1442 438278
U.S.A.	up to 28800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can dial in to 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, use one of the following numbers:

408 654 2706 or **408 654 2703**

3ComFacts Automated Fax Service

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone using one of these international access numbers:

Country	Telephone Number
U.K.	44 1442 438279
U.S.A.	1 408 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number	Country	Telephone Number
Australia	1800 678 515	Netherlands	06 0228049
Belgium	0800 71279	New Zealand	0800 446 398
Denmark	800 17319	Norway	800 11062
Finland	98 001 4444	Portugal	0505 442 607
France	05 90 81 58	Russia (Moscow only)	956 0815
Germany	0130 81 80 63	Singapore	800 6161 463
Hong Kong	800 933 486	Spain	900 964 445
Italy	1678 99085	Sweden	020 792954
Malaysia	1800 801 777	U.K.	0800 626403

3ComForum on CompuServe Online Service

3ComForum contains patches, software, drivers, and technical articles about all 3Com products, as well as a messaging section for peer support. To use 3ComForum, you need a CompuServe account.

To use 3ComForum:

1 Log on to your CompuServe account.

2 Type `go threecom`

3 Press [Return] to see the 3ComForum main menu.

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- A list of system hardware and software, including revision levels

- Diagnostic error messages

- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

Contact your local 3Com sales office to find your authorized service provider using one of these numbers:

Regional Sales Office	Telephone Number
3Com Corporation	
P.O. Box 58145	800 NET 3Com *or*
5400 Bayfront Plaza	1 408 764 5000
Santa Clara, California	408 764 5001 (fax)
95052-8145	
U.S.A.	
3Com Asia Limited	
Australia	61 2 9937 5000 (Sydney)
	61 3 9866 8022 (Melbourne)
Hong Kong	852 2501 1111
India	91 11 644 3974
Indonesia	62 21 572 2088
Japan	81 6 536 3303 (Osaka)
	81 3 3345 7251 (Tokyo)
Korea	82 2 319 4711
Malaysia	60 3 732 7910
New Zealand	64 9 366 9138
Philippines	632 892 4476
P.R. of China	8610 68492568 (Beijing)
	86 21 63501581 (Shanghai)
Singapore	65 538 9368
Taiwan, R.O.C.	886 2 377 5850
Thailand	662 231 8151 5

Regional Sales Office	Telephone Number
3Com Benelux B.V.	
Belgium	32 2 725 0202
Netherlands	31 30 6029700
3Com Canada	
Calgary	403 265 3266
Edmonton	403 423 3266
Montreal	514 683 3266
Ottawa	1 613 566 7055
Toronto	416 498 3266
Vancouver	604 434 3266
3Com France	33 1 69 86 68 00
3Com GmbH	
Austria	43 1 513 4323
Czech Republic/Slovak Republic	420 2 21845 800
Germany	49 30 34 98790 (Berlin)
(Central European HQ)	49 89 627320 (Munich)
Hungary	36 1 250 83 41
Poland	48 22 6451351
Switzerland	41 31 996 14 14

(continued)

Regional Sales Office	Telephone Number
3Com Iberia	
Portugal	351 1 3404501
Spain	34 1 383 17 00
3Com Ireland	353 1 820 7077
3Com Latin America	
U.S. Headquarters	408 326 2093
Northern Latin America	305 261 3266 (Miami, Florida)
Argentina	541 312 3266
Brazil	55 11 5181 0869
Chile	562 633 8935
Colombia	571 629 4110
Mexico	52 5 520 7841/7847
Peru	51 1 221 5399
Venezuela	58 2 953 8122

Regional Sales Office	Telephone Number
3Com Mediterraneo	
Italy	39 2 253011 (Milan)
	39 6 5279941 (Rome)
3Com Middle East	971 4 349049
3Com Nordic AB	
Denmark	45 39 27 85 00
Finland	358 0 435 420 67
Norway	47 22 58 47 00
Sweden	46 8 632 56 00
3Com Russia	007 095 258 09 40
3Com Southern Africa	27 11 807 4397
3Com UK Ltd.	44 131 240 2900 (Edinburgh)
	44 161 873 7717 (Manchester)
	44 162 889 7000 (Marlow)

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S.A. and Canada	1 800 876 3266, option 2	408 764 7120
Latin America	1 408 326 2927	408 764 7120
Europe, South Africa, and Middle East	44 1442 438125	44 1442 435822
Elsewhere	1 408 326 2926	1 408 764 7120

08/04/97

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3Com Corporation LIMITED WARRANTY

HARDWARE

3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Network adapters	Lifetime
Other hardware products (unless specified above)	1 year
Spare parts and spares kits	90 days

If a product does not operate as warranted above during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

SOFTWARE

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